



THE EVOLUTION OF THE **SEA SERPENT**

FROM HIPPOCAMP TO
CADBOROSAURUS





OF ALL THE WORLD'S STOMPING, slithering, and bloodsucking monsters, nothing else quite matches the Great Sea Serpent. Enduring for centuries, the sea serpent legend has a unique place in the history of cryptozoology—and a unique place in my own family history as well.

One of the lessons of cryptozoological investigation is that most cryptids are brand-spanking new. The Loch Ness monster (a Hollywood spin-off) was born after my own grandmother. The modern Bigfoot legend premiered the same year as *Leave It to Beaver*. If the chupacabra (goat sucker) were a person, it would be in high school, the story of this vampiric cryptic from Puerto Rico being only as old as the sci-fi horror movie *Species* (1995), on which it was based.¹

But sea monsters are, if you will forgive me, a different kettle of fish. Descriptions of sea monsters are as old as written language. They appear in the Bible and in the writings of the ancient Greeks and Romans. Even by the very strictest definition, the fully formed modern version of the Great Sea Serpent goes back at least to 1755, when Bishop Erich Pontoppidan's book *The Natural History of Norway* made it a permanent part of global popular culture.

Over the past 250 years, sea serpents have enjoyed a unique level of support from the scientific community. They have been endorsed, discussed, or denounced by some of the great scientific minds in history, including such legendary pioneers of biology as Louis Agassiz, Richard Owen, and Thomas Henry Huxley. Developing alongside the evolution of paleontology and the discovery of dinosaurs and their marine-reptile cousins, the high-level debates about the reality of sea serpents that took place in learned journals and gas-lit parlors helped define the methods and borders of modern science.²

The idea of vast creatures sliding undetected through the abyss stirred my imagination deeply at a young age. How could it not? What kid could read a story like Ray Bradbury's "The Fog Horn" (about a huge, ancient sea serpent drawn to a lighthouse) and not thrill to the idea that it could be true? Imagine such a primeval monster, as Bradbury did, "hid away in the Deeps. Deep, deep down in the deepest Deeps. Isn't *that* a word now . . . the Deeps. There's all the coldness and darkness and deepness in the world in a word like that."³

Why, *anything* could be down there, couldn't it?

But I had a very personal reason to think that sea serpents were just waiting out there to be discovered: my parents saw one, when I was a young child. I was raised as something of a nomad. My family lived in a silver travel trailer and spent winters on the beaches near Victoria, British Columbia. We just

pulled in the trailer, and presto: home. On one of those beaches, my parents saw the twentieth century's best-known regional version of the Great Sea Serpent: Victoria's own Cadborosaurus. I'll let my father tell the story as he remembers it—a story that has shaped my career to this day:

We were right by the water. We were young and happy and life was good. We had a morning ritual of sitting up in bed and looking out to sea while we enjoyed our morning cup of tea.

This particular beautiful summer morning we thought that we saw Cadborosaurus. We both saw it at the same time, and both said something stupid like “Wow, look, a sea serpent,” followed by embarrassment at what we had just said. We jumped up in our bathrobes and ran barefoot down to the water's edge.

There it was, swimming along just 40 feet or so from shore. It was swimming parallel to the beach and making pretty good time. We had to walk briskly to keep up with it, and we wished we had the camera.

We were both saying things like, “It's definitely a sea serpent, see the head? I can even see its eyes!”

It was about 30 ft. long, dark in color and clear as day. It had a head, a neck, and many humps. It was swimming along in perfectly coordinated undulating motion. It appeared to be very real, alive, efficient . . . and very clearly a sea serpent.⁴

What was it, really? Well, that's the question, isn't it? My parents had diverging interpretations of this experience, but as a kid, it seemed obvious to me: it was a sea monster! And I was going to catch it.

For years, I dreamed of just that. I scoured catalogues for monster-hunting equipment. I designed logos for my future Cadborosaurus expeditions. I got my local librarian to help me write to the Loch Ness Phenomena Investigation Bureau. And today, bizarrely enough, I find myself in the professional position of actually investigating monsters (albeit skeptically). Through it all, it seemed—and still seems—perfectly plausible that a sea serpent-like animal could exist. Why not? The ocean is certainly big enough, and it is an exhilarating fact that many of its inhabitants remain completely unknown.

Could some sea serpent stories be true? As with other cryptid mysteries, the best place to start is at the beginning. How did the idea get started in the first place? How did it take the form that it did? Why, for example (and this deeply puzzled me as a kid), are classic sea serpents so often described with horse-like manes?

Why, of all things, would sea serpents have heads that resemble those of horses (or cows, sheep, or camels)?

SEA MONSTERS IN ANTIQUITY

Sea Serpents in Ancient Literature and Classical Art

To find the roots of the sea serpent legend, we'll look back almost 3,000 years to the sunny shores of the Mediterranean. If sea serpents are real, it is likely that the sophisticated coastal cultures of the ancient world would have described and depicted them. After all, the ancients were no slouches, and trade goods and information flowed throughout Eurasia for thousands of years. Besides, sea serpents would tend to stick out. My parents' 30-foot *Cadborosaurus* was a minnow by sea serpent standards. Other witnesses have described sea serpents as long as a blue whale or larger: various reports have put them at 150, 200, 300, or even a staggering 600 feet long. A 600-foot sea serpent would be not so much a cryptid as Godzilla.⁵ Surely, ancient sources would mention the largest animal ever to exist?

Sea monsters are as old as literature—and for good reason! Imagine the ocean through the eyes of the ancients: endless, dark, and deadly. When brave warriors, traders, and fishermen ventured out over that alien abyss, they could only imagine what vast and terrible dangers stirred below. One thing they did know: sometimes the sea swallowed men. To ancient mariners, explains classical scholar Emily Vermeule, the sea was “more like a tightrope over an open tiger-pit than a safe road home.”⁶

Accordingly, the seas of the ancient imagination swarmed with a teeming variety of powerful, malevolent monsters. Many were inspired by true-life animals filtered through folklore, mythology, and the tales of travelers returned from distant lands. Even as these real and folkloric creatures were named, they also blended easily into one another. In particular, the dividing lines between sea monsters, whales, dragons, and snakes were fluid. Think of the biblical Leviathan: a primordial sea monster, yet simultaneously a dragon, but considered by many to be a whale. The book of Job emphasizes the fiery aspects of this vast (if vague) ocean-dwelling monster:

Out of his mouth go flaming torches; sparks of fire leap forth.
Out of his nostrils comes forth smoke, as from a boiling pot and
burning rushes.
His breath kindles coals, and a flame comes forth from his mouth.
(41:11-13)

Isaiah amplifies this hybrid description, calling Leviathan “the dragon that is in the sea” (27:1).⁷ At the same time, many scholars argue that Job's ver-



Figure 5.1 A *ketos* depicted on a Caeretan hydria black-figure vase, ca. 530–520 B.C.E. (Stavros S. Niarchos Collection). John Papadopoulos and Deborah Ruscillo note the “cetacean-like flippers . . . plus what looks suspiciously like a whale fin about two-thirds down the body.” (Redrawn by Daniel Loxton, with reference to John Boardman, “‘Very Like a Whale’: Classical Sea Monsters,” in *Monsters and Demons in the Ancient and Medieval Worlds*, ed. Anne E. Farkas, Prudence O. Harper, and Evelyn B. Harrison [Mainz: Zabern, 1987], and a photograph by S. Hertig [Zurich University Collection])

sion of Leviathan is based on a real animal, with the whale among the leading contenders.⁸ (Such a distorted, mythologized view of a real animal would be consistent with the general lack of familiarity with marine life among the relatively land-locked writers of the Hebrew Bible. As archaeologists John K. Papadopoulos and Deborah Ruscillo note, the Hebrew Bible does not record even one species name to identify any particular sort of fish. Even Jonah’s “whale” is identified simply as “big fish.”)⁹

By contrast, writers and artists immersed in the coastal culture of the ancient Greeks faithfully described many dangerous, delightful, and delicious sea animals in detail. But whales, being relatively rare in the Mediterranean, were as hard to study as they were terrifying. As a result, no clearly identifiable, naturalistic Greek images of whales are known to exist.¹⁰ Instead, “sea monster” and “whale” were interchangeable concepts in early classical literature, with the same word, *ketos*, used for both. *Ketos* is the basis for the word “cetacean,” but it was not originally restricted to whales: it was an umbrella term for anything big and scary that lived in the sea, including whales, sharks, and tuna (figure 5.1).

Alongside the merman (Triton) and the hippocamp (a Capricorn-like creature whose body combines the front half of a horse with the back half of a fish, to which we will return), the *ketos* was one of the three standard sea

monster types employed by Greek artists. As creative vase painters and sculptors explored the *ketos* form over many centuries, several varieties emerged. Many images of the *ketos* straightforwardly depict very big fish. Other artists imagined *ketos* monsters as grotesque hybrids: fishes with the heads of powerful terrestrial animals. Once this mix-and-match scheme became common, artists could combine creatures as creatively as they wished.¹¹ By the Hellenistic period (the three or four centuries following the continent-spanning conquests of Alexander the Great), sea monster art had become more light-hearted and fantastic. Artists were happy to try inventive depictions, as archaeologist Katharine Shepard notes: “We find for the first time in the Hellenistic period the sea-centaur, -bull, -boar, -stag, -lion, -panther and -pantheress.”¹²

Papadopoulos and Ruscillo describe a third style of *ketos* illustration, which is much more intriguing from a cryptozoological perspective: “An alternative manner of representing the *ketos* is as a large serpent-like creature: a snake by any other name. Like the big fish, a suitably massive snake was one, relatively straightforward, way of giving iconographic substance to a massive sea creature that was, above all else, mysterious and frightening.”¹³ This last sort of fantastic, vertically undulating beast included elements from the mutually blurry notions of dragons, fish, whales, and pythons (among other animals),¹⁴ but to the modern eye they scream “sea serpent.” Just look at that vertical undulation! Does this mean that the ancients did have knowledge of a genuine sea serpent 2,000 years before the modern legend emerged in Scandinavia?

Not so fast. It is very easy for modern audiences to be misled when interpreting out-of-context artworks from other times and other cultures. For example, UFOlogists who see “evidence” of flying saucers in medieval or Renaissance paintings mistakenly project their own expectations onto stylized depictions of clouds, the Holy Spirit, or even broad-brimmed hats.¹⁵ As it happens, the long, snaky, vertically undulating tails that make *ketos* images resemble our notion of sea serpents were not unique to those depictions. The same tails were used just as often for hippocamps and for mermen (figure 5.2). It is worth noting that while neither fish nor serpents move by means of vertical undulation, a wavy or an arched body is extremely handy for indicating sinuousness in profile images on vases or shallow relief sculptures. “Of course,” notes legendary cryptozoological writer Bernard Heuvelmans (one of the coiners of the word “cryptozoology”),¹⁶ “most primitive or childish pictures show snakes wriggling in the same way, but this is simply because it

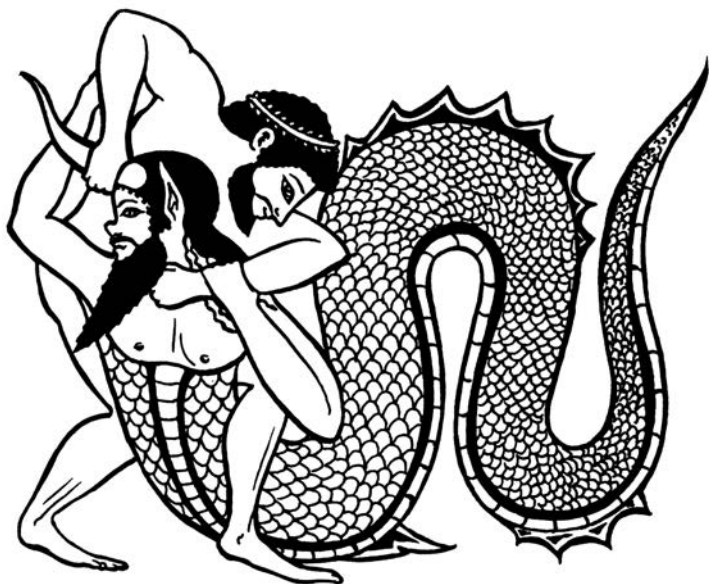


Figure 5.2 Herakles wrestles the river deity Akheloios on an Attic red-figure vase attributed to Oltos, ca. 520 B.C.E. (Redrawn after London E437, British Museum, London)

needs some skill in perspective to draw the side view of an animal that wiggles horizontally.”¹⁷

Is there reason to think that artists modeled the *ketos* on a genuine serpentine animal? No. The *ketos* may be widespread in classical art, but it cannot be used as evidence for the existence of a cryptid. As art historian and archaeologist John Boardman explains in an influential overview of the *ketos*, it is a wasted effort to speculate about “our beast’s relationship to real or imagined sea monsters since we can show that his creation is an artistic amalgam not much troubled by what swam or was thought to swim in the Mediterranean.”¹⁸ Moreover, it is clear that images of the *ketos* changed with the fashions among artists—a pattern more consistent with the depiction of imagined creatures than real animals.

But consider the opposite: What if art inspired the notion of the sea serpent? The universality of vertical undulation as an artistic solution for portraying wiggly movement in static two-dimensional media (and the rarity of vertical undulation in nature) hints that the Great Sea Serpent of modern legend could owe something to art. We will return to the influence of art, but first let’s explore the efforts during the classical period that we would call

“science” today. Classical artists may not have recorded evidence for the existence of the modern sea serpent, but what of those ancient thinkers who attempted to accurately describe the animals of the air, land, and sea?

Sea Serpents in Classical Natural History

The cryptozoological hypothesis that immense sea serpents literally exist has an Achilles’ heel: extremely little demonstrated support in the historical record before the Enlightenment (when sea serpents suddenly burst into prominence in Scandinavia). The pioneering book *The Great Sea-Serpent*, for example, was perfectly up front about the failure to identify sightings from antiquity. Author Anthonie Cornelis Oudemans wrote off the few possibilities he was aware of as misidentification errors and simply declared that he would “review only reports of no earlier date than the year 1500” C.E.¹⁹

Was Oudemans too hasty? It is unambiguously the case that the sophisticated scholars of classical Greece and Rome did, in fact, preserve accounts of sea monster sightings. For example, classical folklorist Adrienne Mayor has identified dozens of ancient references to allegedly real aquatic monsters.²⁰ But did these authorities describe creatures that are recognizably “sea serpents” in the modern sense? To qualify as sea serpents, creatures must (minimally) live in the sea and look like serpents. Some classical texts describe marine monsters that are not serpents. They include a giant man-eating sea turtle²¹ and some clear references to whales (such as the orca enclosed in a harbor and battled by boats as entertainment under the Roman emperor Claudius).²² Others describe serpentine creatures that did not live in the sea (such as a giant snake that allegedly fought Roman soldiers at a river in North Africa).²³

Oudemans briskly dismissed the argument that the animals mentioned by Aristotle, Pliny the Elder, and other classical natural historians were sea serpents, considering them pythons, eels, and known species of sea-adapted snakes. This cavalier approach may seem hard to justify, but I think that he was correct: despite some serpent-like versions of the *ketos* in art, and despite many ancient references to sea monsters in general, classical history and literature can offer little to help the case for the sea serpent in particular.

Consider Aristotle. His meticulous *History of Animals* (350 B.C.E.) is often cited in support of the sea serpent, but this is a stretch too far. The most frequently quoted passage refers simply to “some strange creatures to be found

in the sea, which from their rarity we are unable to classify.” Fishermen apparently described some of these unidentified rarities as “sea animals like sticks, black, rounded, and of the same thickness throughout.”²⁴ This representation may sound suggestive to those sufficiently willing to cherry-pick, but it is vague to the point of meaninglessness. Another passage is much more clear—in that it clearly does not describe a sea serpent:

In Libya, according to all accounts, the length of the serpents is something appalling; sailors spin a yarn to the effect that some crews once put ashore and saw the bones of a number of oxen, and that they were sure that the oxen had been devoured by serpents, for, just as they were putting out to sea, serpents came chasing their galleys at full speed and overturned one galley and set upon the crew.²⁵

Both Aristotle and Oudemans understood that this was an exaggerated, hearsay description of Africa’s native pythons. Such stories of land-based, big snakes were common and had nothing to do with sea monsters. Yet, they sound so tempting! As Bernard Heuvelmans’s respected book *In the Wake of the Sea-Serpents* explains, this hyperbole has led to the widespread misuse of “various stories of gigantic snakes, but living on land, which many authors have tried hard to include in the sea-serpent’s dossier.”²⁶

As with stories of whales and sea monsters, ancient Greek lore about pythons was intertwined (and often interchangeable) with that of dragons. Consider an example from Greek epic poetry. When the legendary hero Jason approaches the grove of the Golden Fleece, the last challenge he must face is a vast serpent (figure 5.3):

Directly in front of them the dragon stretched out its vast neck when its sharp eyes which never sleep spotted their approach, and its awful hissing resounded around the long reaches of the river-bank and the broad grove. . . . Women who had just given birth woke in terror, and in panic threw their arms around the infant children who slept in their arms and shivered at the hissing. As when vast, murky whirls of smoke roll above a forest which is burning, and a never-ending stream spirals upwards from the ground, one quickly taking the place of another, so then did that monster uncurl its vast coils which were covered with hard, dry scales.²⁷

It is not surprising that Greek stories feature land-based mega-serpents. The Greeks had contact with some of the planet’s largest snakes, but not such close contact as to easily distinguish folklore from biology. In modern Africa, large pythons range widely below the Sahara (and may have been encoun-



Figure 5.3

The serpent guardian of the Golden Fleece regurgitates Jason, as Athena watches, on a red-figure cup painted by Douris, ca. 480–470 B.C.E. (Redrawn after Vatican 16545, Vatican Museum, Rome)

tered in North Africa's Mediterranean regions in classical times, as Aristotle reports). The African rock python (*Python sebea*), in particular, which grows to lengths of 20 feet or more, is a “monster” even before the magnifying power of hearsay. Rock pythons occasionally hunt humans for food, with the largest specimens capable of swallowing an adult whole.²⁸

The armies of Aristotle's student Alexander the Great conquered far to the east, invading India in 326 B.C.E. There, Alexander's officers reported seeing snakes as large as 24 feet long and heard claims of snakes many times larger.²⁹ By the time the Roman military commander and naturalist Pliny the Elder compiled his *Natural History* (ca. 77–79), stories of Indian mega-snakes had grown to describe “dragons”³⁰ fond of hunting elephants—indeed, of “so large a size that they easily encircle the elephants in their coils and fetter them with a twisted knot.”³¹ (By the Renaissance, the dragon-versus-elephant idea had been applied to African pythons as well. Edward Topsell wrote in 1608 of the “enmitie that is betwixt Dragons & Elephants, for so great is their hatred one to the other, that in Ethyopia the greatest dragons have no other name but Elephant killers.”)³²

Looking over this literature, Heuvelmans correctly concluded that classical tales “do not refer to the sea-serpent, even in the widest sense, but to other creatures which have nothing to with the case.”³³ This absence is conspicuous when contrasted with the way that classical knowledge of other, known sea animals expanded and improved over time. Aristotle and other natural historians eventually hammered down an accurate understanding of

whales, distinguishing these animals from other sea monsters with the term *phallaina* (the root of the Latin word *baleaena* and the English term “baleen”). By the fourth century B.C.E., Aristotle could describe how whales breathe air through a blowhole instead of gills, bear live young, and even provide milk for those young. No comparable understanding emerged for any sort of sea serpent. This suggests that there were no genuine sea serpents for classical informants to observe.

THE HIPPOCAMP: GRANDFATHER TO THE GREAT SEA SERPENT

Cryptozoology has tended to overlook what I believe to be the pivotal classical example of a sea serpent-like creature: the *hippokampos* or hippocamp (figure 5.4). An imaginary mer-creature, the hippocamp combines the foreparts of a horse with a looping, coiled tail inspired by fish or dolphins (like the Capricorn that many people know from astrology, whose foreparts are those of a goat). Hippocamps appeared first on vases, coins, jewelry, sculpture, and other artworks from ancient Greece and Italy, where they were often used as a purely decorative element. In the 2,500 years that followed, they became a fixture in European art and literature—especially in heraldry. For example, a hippocamp appears on the coat of arms of Belfast, Ireland.

Developed by the Greeks, embraced by the Romans, and passed from country to country during the Middle Ages, the image of the hippocamp slowly mutated into something more than a decoration for vases. Over time, this fantasy creature became an allegedly real cryptid. In my opinion, the modern



Figure 5.4
Poseidon, the Greek god of the sea, rides a hippocamp on Attic black-figure pottery, ca. sixth century B.C.E.

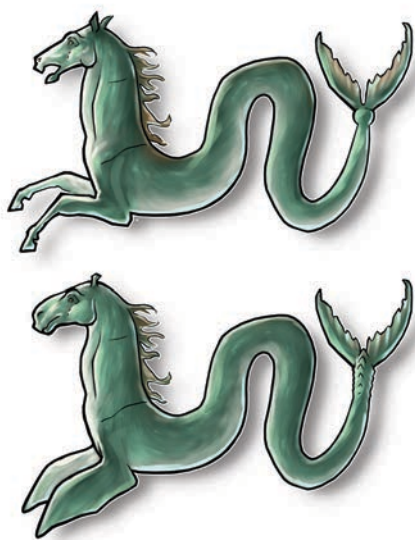


Figure 5.5

The classical hippocamp and the modern cryptid Cadborosaurus share a general body plan, as well as such specific anatomical details as a mane and whale-like tail. (Various artists have regularly depicted both creatures with between one and several humps or tail arches.) (Illustration by Daniel Loxton)

myth of the Great Sea Serpent (including the recent version, Cadborosaurus) is a cultural invention descended from the artistic tradition of the hippocamp.

It is not hard to spot a family resemblance.³⁴ Compare the typical hippocamp with a modern composite drawing of Cadborosaurus (figure 5.5). These creatures are a direct, one-to-one anatomical match—from the tips of their whale-like flukes, to their pectoral limbs, to their horse's manes.³⁵ Here is a clear answer to some of the peskiest questions about the sea serpent: Why the preposterous vertical arches? Why the mane of a horse? Why the head of a horse (or, in some variants, a cow, sheep, or camel)? It is a puzzle that bothered me as a kid and has bothered me throughout my career as a skeptical investigator. Why would sea serpents look so much like horses? It turns out that the answer is simplicity itself. Like Jessica Rabbit in the film *Who Framed Roger Rabbit*, sea serpents have their shape because they were, literally, “drawn this way.”

The horse-headed hippocamp motif first appeared in Greece during the Orientalizing period at around the same time as the Triton (or merman) and the *ketos*-type sea monster. It is important to emphasize at the outset what hippocamps were not. They were not gods. They were not characters in myths. Most important, they were not believed to be real animals. The classical world did have a lively tradition akin to cryptozoology. Serious scholars like Aristotle and Pliny the Elder attempted to fold into natural history the



Figure 5.6
Poseidon, standing on a shell
chariot, being drawn through
the sea by hippocamps.

fantastic creatures described in rumor, legend, and travelers' tales from distant lands. Dragons, unicorns, and griffins fit into this tradition, as do ferocious *ketos* sea monsters. Even mermen were reportedly spotted by eyewitnesses, but hippocamps were not.

Hippocamps existed almost exclusively in art, where they often were depicted as steeds for mythological beings associated with the sea (figure 5.6). They appeared as an artistic motif at around the same time as the emergence of artwork that featured a similar-looking real-world fish: the spiral-tailed, horse-headed sea horse.³⁶ Indeed, these real and mythological creatures reflect each other so well that sea horses are classified as members of the genus *Hippocampus*, giving these delicate little fish the unlikely designation "horse sea monster." Recursively, the fantastical hippocamps may have been inspired by the fish—although the origin of the monster is unclear. Archaeologist Katharine Shepard reflected that interpreting the significance of the hippocamp is a "difficult problem, since he plays no part in any mythological tale":

Some have thought that the horse was symbolic of the waves of the sea. Poseidon riding a hippocamp or Poseidon in a chariot drawn by hippocamps would then represent Poseidon borne by the waves. Another idea is that the monster is intended as a likeness of a real sea-horse, but our knowledge of sea-horses does not justify

this theory. Probably the hippocamp is a purely fantastic monster, which served sometimes as a symbol of the sea. Often the animal seems merely to be used for decorative purposes.³⁷

How did a decorative creature break free from the realm of art to take a central place in cryptozoology? Let's trace that strange transformation.

The Hippocamp Spreads Across Europe

The hippocamp motif was adopted by the Romans and eventually diffused across Europe. The Romans themselves may have carried it to England and Scotland (figure 5.7). They invaded Britain in 43 C.E. and ruled much of the island for almost four centuries. The cultural legacy of the Roman presence in Britain persisted long after the end of Roman rule. This influence is a plausible source of hippocamps found (for example) in Aberlemno, Scotland, where they add a decorative flourish to ninth-century Pictish relief sculpture.³⁸



Figure 5.7 A section of the mosaic floor from the Roman Baths in Bath, England, ca. fourth century C.E. (Photograph by Andrew Dunn, via Wikimedia Commons. Released under Creative Commons Attribution-Share Alike 2.0 Generic license)

The enduring popularity of classical literature helped carry the concept of the hippocamp into the Middle Ages and beyond. For example, the Roman poet Virgil wrote that the mythological Proteus

. . . rides o'er

The sea, drawn by strange creatures, horse before

And fish behind.³⁹

Virgil was read everywhere in Christian Europe. (Likewise, the mosaics, paintings, and sculptures of antiquity were widely admired and copied long after the fall of the Roman Empire.)

An immensely popular Greek text called the *Physiologus* was instrumental in transmitting the concept of the hippocamp. Composed in Alexandria, Egypt, between the second and fourth centuries,⁴⁰ the *Physiologus* is a collection of legends about interesting and exotic animals from the fox to the unicorn—but it is not a work of natural history. The unknown compiler intended the *Physiologus* to be read for moral instruction. Drawing material from the legends and natural history of classical antiquity, the *Physiologus* reconceived each creature in the service of overt Christian allegory.⁴¹ Appearing alongside such old favorites as the centaur, siren, and phoenix, the hippocamp (Hydrippus) became a symbol for Moses:

There is also a beast called the Hydrippus. The front part of his body resembles a horse, but from the haunch backwards he has the shape of a fish. He swims in the sea, and is the leader of all fishes. But in the Eastern parts of the earth there is a gold-coloured fish whose body is all bright and burnished, and it never leaves its home. When the fish of the sea have met together and gathered themselves into flocks, they go in search of the Hydrippus; and, when they have found him, he turns himself towards the East, and they all follow him . . . and they draw near to the golden fish, the Hydrippus leading them. And, when the Hydrippus and all the fish are arrived, they greet the golden fish as their King. . . . The Hydrippus signifies Moses, the first of the prophets.⁴²

The Greek *Physiologus* was soon translated into Ethiopian, Armenian, Syrian, Arabic, and Latin. From there, the evolution of the book got more complicated. (Translator Michael Curley dryly understates, “The influence of *Physiologus* on the literature and art of the later Middle Ages is too long a story to be fully recounted here.”)⁴³ For our purposes, it’s enough to note that a rich and



Figure 5.8 A hippocamp depicted in the Ashmole Bestiary, ca. 1225–1250. (MS. Bodl. 764, fol. 106r; reproduced by permission of the Bodleian Libraries, The University of Oxford)

varied ecosystem of versions and adaptations emerged, with hand-drawn manuscripts in many languages spreading throughout Europe.

“A major watershed in the later history of *Physiologus*,” Curley continues, “is its incorporation into the encyclopedias and natural-historical compendia of the late Middle Ages.” In particular, the influential *Etymologies* (ca. 623) of the archbishop and scholar Isidore of Seville drew heavily on the legends collected in the *Physiologus*, while dropping most of the Christian allegorical content. In Isidore’s treatment, the hippocamp is rendered down from a Moses figure to an ordinary sea creature. Smack dab between whales and

dolphins is the entry for “Sea-horses (*equus marinus*), because they are horses (*equus*) in their front part and then turn into fish.”⁴⁴ This demythologized version brought the fantastical hippocamp a step closer to its modern reinvention as a cryptid.

The tradition of compiling animal legends continued in a genre of twelfth- and thirteenth-century books referred to generically as the “bestiary” (book of beasts). Larger collections than the *Physiologus*, they contain three times the content of the earlier books. Bestiaries include exotic monsters, but the central passages feature ordinary creatures made to serve Christian allegory. “For what is the good of a lesson that can only be taught by hearsay,” asks translator Richard Barber, “relating to a beast that no one has ever seen in the flesh? The longest sermons are devoted to topics drawn from everyday life: the ant and the bee display the virtues of humility, obedience and industry, the viper warns against the sin of adultery.”⁴⁵

Bestiaries were hand-copied (and creatively improvised) from previous bestiaries, and they varied enormously. Some describe the hippocamp; in others, the hippocamp appears as an illustration. The lavishly gold-leafed Ashmole Bestiary, for example, features an illustration of the hippocamp in its general discussion of fishes (figure 5.8).

The Hippocamp in Nordic Culture

The modern sea serpent legend was born out of Nordic culture, with its origin in medieval Iceland and its florescence in Enlightenment Norway.

THE ICELANDIC HROSSHVALR By the twelfth century, the Norse society of Iceland had adopted a belief in a creature called the *hrosshvalr* (horse whale), which was depicted as an unmistakable hippocamp. We will see that this innovation—the Nordic reimagining of the Greek hippocamp as a maned, horse-headed “real” marine monster—is a key to solving the modern mystery of the Great Sea Serpent.

As a maritime culture, the Norse naturally told tales of a great many sea monsters—including a huge, kraken-like creature called the *hafgufa*—but even among these teeming monstrosities, the *hrosshvalr* was considered especially savage. It was described in a twelfth-century text called *The King’s Mirror* (*Konungs Skuggsjá*), which was almost certainly intended to instruct the son of a Norwegian king.⁴⁶ Along with lessons in statesmanship and

trade, *The King's Mirror* taught the unknown prince about useful species of whales and warned him of the dangerous monsters of the sea:

There are certain varieties that are fierce and savage towards men and are constantly seeking to destroy them at every chance. One of these is called *hrosshvalr*, and another *raudkemingr*. They are very voracious and malicious and never grow tired of slaying men. They roam about in all the seas looking for ships, and when they find one they leap up, for in that way they are able to sink and destroy it the more quickly. These fishes are unfit for human food; being the natural enemies of mankind, they are, in fact, loathsome.

Scholars have tended to identify these creatures as walruses or sea lions, although *The King's Mirror* specifies that the *hrosshvalr* and *raudkemingr* grow to “thirty or forty ells in length,” or about 67 to 90 feet. It’s probable that the words *hrosshvalr* (horse + whale) and “walrus” (whale + horse) are etymologically related. (J. R. R. Tolkien, a philologist and the author of *The Lord of the Rings*, struggled with the etymology of the term “walrus” for the *Oxford English Dictionary* during his tenure with the dictionary in 1919 and 1920.)⁴⁷ It is possible that *hrosshvalr* started out as a word for “walrus” and was later applied to a fanciful monster. Nonetheless, whatever the original meaning of “horse-whale,” the *hrosshvalr* took on a familiar form, a form that it keeps to this day: when Flemish mapmaker Abraham Ortelius depicted the *hrosshvalr*, he drew the creature as a classical hippocamp (figure 5.9).



Figure 5.9 The *hrosshvalr* depicted by Abraham Ortelius on his map of Iceland, published in 1585.



Figure 5.10

A life-like interpretation of a *hrosshvalr* on an Icelandic stamp issued in March 2009. (Illustration by Jón Baldur Hlíðberg; image courtesy of Iceland Post)

Ortelius made historic contributions to cartography, creating the first modern atlas in 1570 (and later, incidentally, proposing continental drift). His depiction of the hippocamp as a living monster also marked a critical milestone in the formulation of the sea serpent. Ortelius lavishly populated his maps with monsters, many borrowed from the work of Olaus Magnus or harkening back to the curly-tailed *ketos*. The map of Iceland that Ortelius published in 1585 teems with ferocious beasts, including our friend the *hrosshvalr*. He described it as “sea horse, with manes hanging down from its neck like a horse. It often causes great scare to fishermen.” In his illustration, the hippocamp has long webbed toes and a finny frill on the back of its horse-like forelimbs—a form that it often takes in heraldry. (In other heraldic uses, the hippocamp may have front flippers instead of webbed feet.) The *hrosshvalr* still has essentially this shape, although now filtered through the sensibilities of modern fantasy art. It is depicted, for example, as a maned, flippered, hippocamp-like animal on a stamp issued by the Icelandic government in 2009 (figure 5.10).

THE MIDGARD SERPENT The hippocamp-inspired *hrosshvalr* of medieval Iceland is not the only relevant source for the Great Sea Serpent. We must also consider a vast entity from Norse mythology called Jörmungandr: the World Serpent or Midgard Serpent. Jörmungandr was a child of the Norse god Loki. Cast down into the watery abyss by Odin, the ruler of the gods, Jörmungandr grew into a serpent so large that his body stretched around Earth. According to an older story recorded in the medieval Norse *Prose Edda*, the god Thor successfully fished for Jörmungandr using a huge hook and an ox’s head for bait (figure 5.11).



Figure 5.11

Jörmungandr, the World Serpent or Midgard Serpent, takes the ox's head bait dangled by the Norse thunder god, Thor. (Redrawn from a seventeenth-century Icelandic manuscript)

When the modern sea serpent legend eventually made its way into academic debates (starting in the 1750s with a treatment written by Bishop Erich Pontoppidan of Norway), scholars were quick to suggest that it could be the Jörmungandr myth repackaged for a scientific age. Discussing the tale of Thor fishing for the Midgard Serpent, Bishop Thomas Percy noted in 1770, “We see plainly in the . . . fable the origin of those vulgar opinions entertained in the north, and which Pontoppidan has recorded concerning the craken and that monstrous serpent described in his *History of Norway*.”⁴⁸ A century later, this view was still invoked as an explanation for the sea serpent. In 1869, *The New American Cyclopaedia* held:

It is important to observe that the idea of a sea serpent certainly originated in northern Europe, and was clearly mythological in its first conception. The Midgard serpent, offspring of Loki, which girds the world in its folds and inhabits the deep ocean till the “twilight of the gods,” when it and Thor will kill each other, plays a conspicuous part in the *Edda*; and the gradual degradation of the idea from mythology to natural history in its native seats may be traced in Olaus Magnus and the later sagas, till the Latin of Pontoppidan gave it currency in Europe with the natural additions of popular fancy.⁴⁹

Is this view correct? Is the modern sea serpent descended from Jörmungandr? It is probably not a coincidence that a culture with a stupendously large mythological sea serpent later invented a stupendously large cryptozoological sea serpent, but the exact relationship is not entirely clear. (As early as 1822, attempts were made to turn the argument on its head: perhaps a species of serpentine cryptid gave rise to the Norse myth, rather than the other way around.⁵⁰ As A. C. Oudemans elaborated, “All fables have their foundation in facts, or in objects of nature, and it is plausible that the Norwegians had met with the sea-serpent before the fable of Thor’s great Serpent was inserted into their *Eddas*.”)⁵¹

It is certainly plausible, even likely, that the Jörmungandr myth could be among the roots of the Norwegian sea serpent legend. In turn, the Midgard Serpent can be plausibly interpreted as a regional iteration of primordial dragon myths, such as the Babylonian Tiamat and the biblical Leviathan. It’s worth noting that our sources for the Midgard Serpent and other Norse myths date from well into the Christianization of the Nordic countries. Written by a Christian, *The Prose Edda* begins with the words, “In the beginning God created heaven and earth and all those things which are in them; and last of all, two of human kind, Adam and Eve, from whom the races are descended.”⁵²

Albertus Magnus

Whatever the true source and impact of the Jörmungandr myth, belief in the hippocamp continued to spread and develop. Some of Europe’s greatest intellectual lights took up the topic of the mer-horse, including the natural philosopher Albertus Magnus (Albert the Great).

Born at the dawn of the thirteenth century, Albertus worked in a twilit age of both deep superstition and remarkable advances (such as windmills, ship rudders, and, at the end of his life, papermaking in Italy). Albertus started off slowly. “For the first thirty years of his life he appeared remarkably dull and stupid,” according to Charles Mackay.⁵³ He became a Dominican friar and eventually a bishop—and, along the way, one of the medieval world’s most celebrated scholars, remembered today as a towering prescientific thinker.⁵⁴ (The famed Catholic theologian Thomas Aquinas was a student of Albertus Magnus.)

Albertus Magnus is best known for his encyclopedic *De animalibus*, which built on the work of Aristotle (with material from other authorities, includ-

ing insights from Albertus himself). Among the menagerie of real aquatic animals and mythical marine monsters is our old friend the hippocamp, described as a predator, “alive” and well at the cutting edge of scholarship that would one day give rise to zoology and cryptozoology: “*equus maris* (Sea horse) is a marine animal whose foreportion takes the form of a horse and rear parts terminate like a fish. It is a pugnacious creature, inimical to many marine species, and its diet consists of fish. It has an abject fear of man; outside the water it is utterly helpless and dies soon after being removed from its native element.”⁵⁵

Olaus Magnus

The now-familiar modern sea serpent had no existence as a cryptid during the Middle Ages. Medieval witnesses saw many other menacing monsters of the deep, including hippocamps, but not the Great Sea Serpent. On the contrary, the Great Sea Serpent turns out to be a fish story of relatively recent composition. An important milestone in its development came with the scholarship of Olaus Magnus, the archbishop of Uppsala in Sweden. For many commentators, Olaus is considered the original sea serpent author, although we’ll see that the honor does not belong only to him.

Around the time that Nicolaus Copernicus proposed his heliocentric model of the solar system, Olaus Magnus created an advanced map of the Scandinavian countries and wrote a lengthy book about the people, customs, and animals of those lands. Known in English as *A Description of the Northern Peoples* (1555), the book became the standard reference on Scandinavia. It also provided the final stage set for the modern sea serpent (although the curtain would not fully open for a further 200 years). By then, the Scandinavian reimagining of the Greek hippocamp as a “real” sea monster was itself a centuries-old tradition. Like Albertus Magnus before him, Olaus Magnus described this *Equus marinus* as a genuine, living animal: “The sea-horse may be observed fairly often between Britain and Norway. It has a horse’s head, utters a neighing sound, has cloven hoofs like a cow, and seeks its pasture as much in the sea as on land. It is seldom caught, even though it reaches the size of an ox. Lastly, its tail is bifurcated like a fish’s.”⁵⁶

Olaus also presented a menagerie of other exotic sea monsters, including a “monstrous Hog” with “four feet like a Dragons, two eyes on both sides in his Loyns, and a third in his belly, inclining toward his navel.” Another seem-

ingly unlikely creature was “a Worm of blew and gray colour, that is above 40 cubits [60 feet] long, yet is hardly so thick as the arm of a child.” Oddly enough, this worm (which he claimed to have regularly seen himself) appears to be a real animal: the thin nemertean bootlace worm (*Lineus longissimus*), which can grow longer than 100 feet.⁵⁷

But it is to another Olaus Magnus monster that we must turn—a land-based Norwegian serpent that, Olaus said, sometimes entered the water to hunt. This has become one of the most-quoted passages in the vast sea monster literature:

Those who do their work aboard ship off the shores of Norway, either in trading or fishing, give unanimous testimony to something utterly astounding: a serpent of gigantic bulk, at least two hundred feet long, and twenty feet thick, frequents the cliffs and hollows of the seacoast near Bergen. It leaves its caves in order to devour calves, sheep, and pigs, though only during the bright summer nights, or swims through the sea to batten on octopus, lobsters and other crustaceans. It has hairs eighteen inches long hanging from its neck, sharp, black scales, and flaming-red eyes. It assaults ships, rearing itself on high like a pillar, seizes men, and devours them. It never appears without denoting some unnatural phenomenon and threatening change within the state; the deaths of princes will ensue, or they will be hounded into exile, or violent war will instantly break out.⁵⁸

This serpentine animal appears in virtually every book and documentary on the topic of sea serpents, cited as the canonical first important record of the Great Sea Serpent. It is easy to understand why so many authors fall into this trap. A maned snake that snatches screaming sailors from the rigging? Sure sounds like the monster of modern legend! But it isn’t—not quite. Not yet.

Looking back at Olaus Magnus’s account, pioneering sea serpent author A. C. Oudemans was happy in 1892 to take those elements that conformed to his own vision of the sea serpent—and to discard the rest arbitrarily, decreeing, for example, the testimony of “its devouring hogs, lambs, and calves, and its appearance on summer nights on land to take its prey to be a fable.”⁵⁹ In constructing his cherry-picked version, Oudemans fundamentally misrepresented the dragon-like snake that Olaus had described. According to Olaus, this monster does not venture onto land to take its prey, but lives and hunts on land (in “cliffs and hollows of the seacoast”) and occasionally enters the water to harvest seafood (such as the sailors it cracked “like sugared almonds,” as a magazine article put it in 1843).⁶⁰ This lifestyle is firmly underlined by the



Figure 5.12 The serpent depicted in Olaus Magnus's *Description of the Northern Peoples* emerges from a cave on land to prey on the crews of passing ships.

accompanying illustration in *A Description of the Northern Peoples*, which clearly shows the serpent emerging from its cave on land (figure 5.12)!

A serpent, sure. The modern sea serpent? No. Olaus Magnus's snake should be viewed as a component legend, a root. It has the mane of the hippocamp, and it is a menace to ships, but Olaus Magnus was clear in describing it as a land-based monster. It is, in short, a *lindorm*—one of the standard gigantic snakes or dragons in Scandinavian folklore.

It's important to realize as well that supernatural phenomena were fundamental components of *lindorm* stories of this period. When Olaus Magnus wrote that the appearance of the serpent foretells a major upheaval, such as a royal death or a major war, he was not kidding—and he was not just tacking on some bit of superstitious gloss to the end of a naturalistic wildlife sighting. The supernatural significance is what those stories are about; the naturalism that cryptozoologists impose on them is the artificial gloss. Nonetheless, such revisionist demystification is a long-standing (and ongoing) tradition.⁶¹ When science-minded Bishop Erich Pontoppidan repeated Olaus Magnus's snake story 200 years later, he felt it was obvious that Olaus "mixes truth and fable together . . . according to the superstitious notions of that age."⁶² Bernard Heuvelmans likewise pooh-poohed the supernatural aspects of Olaus Magnus's account ("We may smile at His Eminence's naïveté"), but the truth is that such arbitrary editorializing is reckless. Folklorist Michel Meurger is scathing of the way that Heuvelmans and other cryptozoologists omit or downplay the supernatural, calling it a "gross distortion" of these stories.⁶³

The Evolving Sea Serpent

Two more centuries would go by before the parallel currents of folklore described by Olaus Magnus—the *lindorm* and Scandinavian iterations of the hippocamp—would converge to form the modern sea serpent legend. During those 200 years, scholars continued to discuss the hippocamp by its many names: “hippocamp” or “hyppocamp” (English); *hippokamos* or *Hydrrippus* (Greek); *sjø-hest* (Norwegian); *hroshvalur*, *hrossvalur*, or *roshwalr* (Icelandic); *Equus marinus*, *Equus aquaticus*, or *Equus bipes* (Latin); and *cheval marin* (French). Following those discussions is difficult, complicated by the fact that most European cultures had their own version of the hippocamp-style monster, plus related (yet distinct) supernatural, kelpie-type water-horses associated with bodies of freshwater. In most of the languages, the word for the hippocamp-monster is the same as the name for delicate little fishes: sea horse. And, to make things even more bewildering, many hippocamp-type monsters are interchangeable with walruses!

In all this confusion, the English-language cryptozoological and skeptical literatures have typically treated the hippocamp-type monsters as rather marginal creatures with no particular relationship to the sea serpent. Still, I am not the first to note that the old Scandinavian mer-horse traditions became part of the formulation of the new Scandinavian sea serpent. Referring to the work of Norwegian writer Halvor J. Sandsdalen, Michel Meurger explains that the modern sea serpent represents a hybridization, a “fusion of several fabulous creatures originally clearly differentiated in Norwegian folklore”:⁶⁴ the terrifying half-fish, half-horse monster called the *havhest* (another Scandinavian synonym for “hippocamp”) blended with the *lindorm*, “a land snake blown to gargantuan proportions.”

We’ll come to that moment of fusion—the moment the modern sea serpent was born—shortly. For now, let’s look more closely at the evolution of the hippocamp as an allegedly real monster at the dawn of the scientific era.

Some authorities of the late Middle Ages and early modern period took the mer-horse to be a fact of natural history, on the sensible basis that people sometimes saw them. Others correctly linked the folk belief in horse-headed sea monsters to the classical concept of the hippocamp. French naturalist Pierre Belon and Swiss naturalist Conrad Gesner were among the skeptics. A specialist in marine animals, Belon straightforwardly identified the hippocamp as the “fabulous horse of Neptune” (figure 5.13).⁶⁵ As we have seen,

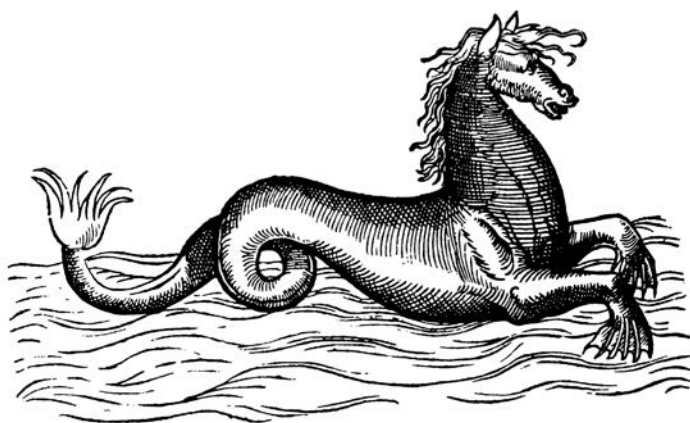


Figure 5.13 The hippocamp as depicted in both Pierre Belon's *De aquatilibus*, a treatise on fishes, and book 4 of Conrad Gesner's *Historiae animalium*.

Olaus Magnus argued in 1555 that the hippocamp was a genuine animal, but Gesner (an even more towering figure in zoological history) accepted Belon's debunking analysis. Gesner's encyclopedia *Historiae animalium* (1551–1558) was the most ambitious natural history text written since the fall of Rome. Gesner repeated Belon's argument that modern sea horse sightings are based on an invented classical fancy:

The Ancients took great liberties with their charming fables, crafted to conceal the truth yet be believed and cloud the credulous minds of men in a haze of nonsense. . . . Those who put their faith in the silly pictures of the ancients are deceived. . . . It all comes from the desire of princes for the fame of their name and the wonder of scholars: since they wished to signify their dominion over land and sea, they joined together the two animals that symbolize these elements, horse and dolphin, which became a monstrous fusion of marine detritus they still call by the name of Hippocampus.⁶⁶

Gesner was much less skeptical in his treatment of other monsters discussed by Olaus Magnus. He repeated the descriptions and illustrations of two species of sea serpent: a smaller type (about 30 or 40 feet long) and the dragon-like mega-serpent portrayed by Olaus:

On the same map there is another sea-serpent, a hundred or two hundred feet long . . . or three hundred . . . which sometimes appears near Norway in fine weather, and is dangerous to Sea-men, as it snatches away men from ships. Mariners tell

that it incloses ships, as large as out trading vessels . . . by laying itself round them in a circle, and that the ship is then turned upside down. It sometimes makes such large coils above the water, that a ship can go through one of them.⁶⁷

Gesner's otherwise faithfully redrawn version of the illustration in *A Description of the Northern Peoples* makes the critical change of moving the monster to open water, rather than emerging from a cave on shore (figure 5.14). The illustration of the smaller serpent shows another modern feature: the serpent floats with its coils arching cartoonishly out of the water (figure 5.15). As Bernard Heuvelmans later noted, this now-canonical detail is fundamentally ridiculous: "Perhaps the great number of humps in the great sea serpent is the result of the naïveté or incompetence of the illustrators. Gesner's picture of his 'Baltic' sea serpent certainly leads one to think so, for the way the animal floats almost entirely out of the water would be mechanically impossible for anything but a balloon."⁶⁸

Alongside the fledgling Scandinavian idea of the sea serpent, belief in the monstrous sea horse continued. Surgeon Ambroise Paré took up the topic in his book *Des monstres et prodiges* (1573). Caught between the superstition of the Middle Ages and the first stirrings of proto-scientific empiricism, Paré was intensely interested in medical marvels (gruesome birth defects, in particular) but also turned his attention to black magic, celestial portents, and

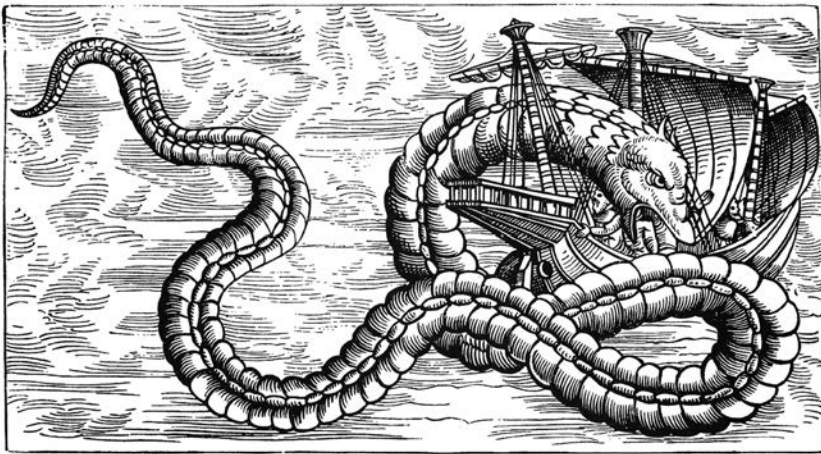


Figure 5.14 The land-based mega-serpent of Olaus Magnus becomes the ocean-going sea serpent of Conrad Gesner.

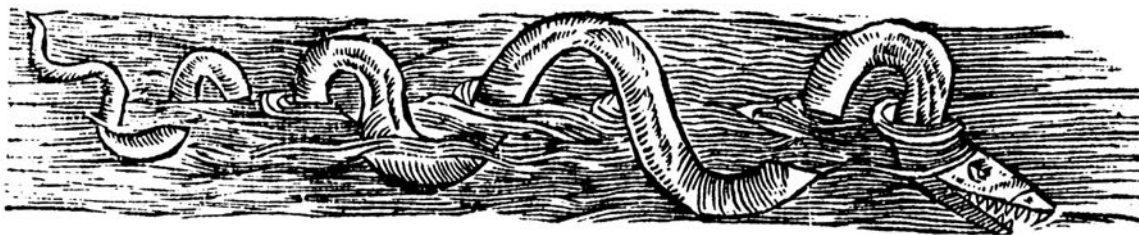


Figure 5.15 Conrad Gesner's smaller type of sea serpent, as reproduced in Edward Topsell's *Historie of Serpents*.

monsters. After discussing several sorts of mermen, Paré described the hippocamp as a living creature: “This marine monster having the head, mane and forequarters of a Horse, was seen in the Ocean sea; the picture of which was brought to Rome, to the Pope then reigning.”⁶⁹ (It’s interesting how these ideas cluster: after 2000 years, classical Greek Tritons and hippocamps were still swimming alongside each other in the European imagination.) It was around this time, in 1585, that mapmaker Abraham Ortelius depicted the Icelandic *hrosshvalr* as a classical hippocamp, “with manes hanging down from its neck like a horse.”

As the infant scientific tradition began to wobble to its feet, so too did a related tradition that I work in: what is now called scientific skepticism, or the critical examination of popular beliefs, especially of paranormal claims.⁷⁰ Scientifically inclined writers began to ask which beliefs could be supported by empirical evidence and which were baseless superstitions. These attempts themselves often amounted to little more than reactionary scorn, and many of them proved to be as inaccurate as the claims they were critiquing. In England, physician Sir Thomas Browne’s book *Pseudodoxia Epidemica: Or, Enquiries into Very Many Received Tenets and Commonly Presumed Truths* (1646; also called *Vulgar Errors*) blends religious reasoning, the new empirical spirit, and ancient wisdom to produce a wonderful hit-and-miss prototype of the skeptical genre. Browne was quite right to doubt the “very questionable” claims that chameleons consume nothing but air and that the “flesh of Peacocks corrupteth not,” and he likewise nailed the falsity of the belief in hippocamps. In his day, the sea horse was cited as proof of the folkloric notion that all the animals of the land were reflected by counterparts in the sea. Browne would have none of it, retorting scornfully, “As for sea-horses which confirm this assertion; in their common descriptions they are but Grottesco deliniations which fill up empty spaces in maps, and meer pictorial inventions, not

any physical shapes.” He insisted that the folkloric sea horse was identical to the classical hippocamp.⁷¹ (Browne emphasized that this mythical sea horse was distinct from the walrus and the curly-tailed fish, both of which were also called sea horse—as was, I might add, the hippopotamus in many medieval sources. I can’t help but empathize with Browne’s frustration: these several conflated creatures are a hassle to disentangle.)

Despite the skeptics, the belief in the monstrous sea horse persisted throughout European culture. For example, a quick-tempered Jesuit missionary named Louis Nicolas described the hippocamp as an animal living in Canada. Nicolas traveled extensively within Canada between 1664 and 1675 and produced his *Codex canadensis* (a hand-drawn, seventy-nine-page document depicting the animals and aboriginal peoples of Canada) around 1700.⁷² Nicolas showed an unambiguous classical hippocamp, matter of factly drawn alongside a beaver (figure 5.16), as a “sea-horse which is seen in the fields on the banks of the Chisedek River, which empties into the Saint Lawrence.”⁷³

By that time, the hippocamp had endured for two millennia, evolving from a purely artistic creature of fantasy to a monster accepted as real by scholars and regular folks across Europe and beyond. And it was not done yet.

THE BIRTH OF THE SCANDINAVIAN SERPENT

The Scandinavian sea serpent was finally born at the end of the seventeenth century. It existed then only as a regional monster, but the moment of fusion had come. As the Scandinavian serpent matured, German scholar Adam Olearius recorded a third-hand sighting around 1676 (“on the Norwegian coast, he saw in the calm water a large serpent, which seen from afar, had the thickness of a wine barrel, and 25 windings”), and historian Jonas Ramus recorded another sighting in 1698.⁷⁴

The fully modern reformulation of Olaus Magnus’s shore-dragon as a gigantic, fully aquatic marine serpent with arching coils and a mane (the sea serpent form that survives as the cryptid Cadborosaurus) finally emerged as an established part of Norwegian folklore in 1694, when it was recorded in Hans Lilienskiöld’s hand-scripted and gorgeously painted four-volume *Speculum boreale* (*Northern Mirror*). Lilienskiöld was a high government official whose writing explored the culture, geography, and wildlife of the northernmost parts of Norway.⁷⁵ The *sjø-ormen* (sea-worm), Lilienskiöld wrote, “cannot be considered anything less than a bad vermin which often curves 236 feet in quiet seas, so it looks like a number of ox-heads have been thrown into the water.”⁷⁶



Figure 5.16 The hippocamp as *cheval marin* in Louis Nicolas's *Codex canadensis*. (Collection of the Gilcrease Museum, Tulsa, Oklahoma)

Crucially, Lilienskiold's sea serpent featured a "light-grey mane which goes a fathom down below the neck," thereby merging the parallel traditions of the hippocamp, the serpentine *lindorm*, and the unnamed monsters of the sea. In a remote corner of Norway, a hybrid folkloric monster had been born.

This new kind of sea serpent had what it took to become a star. All it needed was a promoter, a well-positioned publicist. That promoter was Bishop Erich Pontoppidan.

Erich Pontoppidan

Two hundred years after Olaus Magnus, the sea serpent was an established part of folk belief in Scandinavia—and only there. This point deserves boldfacing and underlining: the sea serpent was an exclusively Scandinavian creature, a cultural relative of the Icelandic *hrosshvalr* and *havhest* traditions. As Bernard Heuvelmans explained, "The sea-serpent was rarely heard of except in Scandinavia. There it was considered as a real animal and elsewhere as a Norse myth."⁷⁷

Then everything changed. The man responsible was Erich Pontoppidan, the bishop of Bergen in Norway from 1747 to 1754. Pontoppidan was not only a highly placed clergyman, but also a reputable member of the Royal Danish Academy of Sciences. For this reason, it made a splash when his two-volume *Natural History of Norway* boldly argued for the flesh-and-blood reality of "the Mer-maid, the great Sea snake, of several hundred feet long, and the Krake[n] whose uncommon size seems to exceed belief."⁷⁸ His advocacy for these creatures caught the imagination of the world. In particular, Pontoppidan's sea serpent took off as a global popular mystery—igniting a scientific debate that would rage through the eighteenth and nineteenth centuries and continue among cryptozoologists in the twentieth and twenty-first.

When Pontoppidan turned his considerable talents to the discussion of the sea serpent, the Norwegian coast remained "the only place in Europe visited by this strange creature."⁷⁹ But there, sea serpents were already an entrenched part of popular culture. For example, Pontoppidan quoted a treatment by the foremost Norwegian poet of the previous generation, Petter Dass:

The great Sea Snake's the subject of my verse,
For tho' my eyes have never yet beheld him,

Nor ever shall desire the hideous sight;
 Yet many accounts of men of truth unstain'd,
 Whose ev'ry word I firmly do believe,
 Shew it to be a very frightful monster.

Many Norwegians accepted the reality of the sea serpent, while skeptics, who “are enemies to credulity, entertain so much the greater doubt about it.” Either way, by then everyone in Norway had heard of the legendary monster. As Pontoppidan reported, “I have hardly spoke with any intelligent person” who was not able to give “strong assurances of the existence of this Fish”—and to describe it.⁸⁰ That sea serpents had become a widely familiar, culturally available explanation for ambiguous or unfamiliar sights at sea should have given Pontoppidan pause, but he seems not to have realized the implications. Instead, he built his case on the aggregate of sighting reports, just as cryptozoologists do, citing “credible and experienced fishermen, and sailors, in Norway, of which there are hundreds, who can testify that they have annually seen” sea serpents.⁸¹ He was impressed by the way in which eyewitnesses “agree very well in the general description,” adding that “others, who acknowledge that they only know it by report, or by what their neighbors have told them, still realize the same particulars.”⁸² This was a critical error. Pontoppidan treated cultural sea serpent lore as a *confirmation* of eyewitness testimony, rather than as a *generator* of sighting reports.

Be that as it may, some of the sightings were spectacular, leading the bishop to believe that sea serpents grew to a whopping 600 feet long. Witnesses also persuaded him that the necks of Norwegian serpents featured “a kind of mane, which looks like a parcel of sea-weeds hanging down to the water” (figure 5.17). Fifty years after Hans Lilienskiold first described the truly modern sea serpent, the *hrosshvalr*- and *havhest*-derived mane persisted as a key feature of the folk belief (and, by virtue of looking like seaweed, provided an obvious source for mistaken sightings).

This cultural DNA from the hippocamp is glaringly obvious in Pontoppidan’s primary case study: the sworn testimony of naval officer Lawrence de Ferry. As a science-minded scholar, Pontoppidan was a voracious seeker of information who combed the literature, wrote letters, and questioned widely along the docks. “Last Winter,” he wrote,

I fell by chance in conversation on this subject with captain Lawrence de Ferry . . . who said he doubted a great while, whether there was any such creature, till he had



Figure 5.17 The maned *sjø-ormen* (sea-worm), drawn by Hans Strom, in Erich Pontoppidan's *Natural History of Norway*.

the opportunity of being fully convinced, by ocular demonstration, in the year 1746. Though I had nothing material to object, still he was pleased, as a further confirmation of what he advanced, to bring before the magistrates, at a late sessions in the city of Bergen, two sea-faring men, who were with him in the boat when he shot one of these monsters.⁸³

Ferry wrote a statement describing his encounter, and his men swore before the magistrates that the statement was correct. Ferry had, the statement said, been at sea on a calm day when his eight rowers told him that “there was a Sea-snake before us.” He ordered the men to intercept the creature and “took my gun, that was ready charged, and fired at it.” The animal dived, leaving blood in its wake. “The head of this snake,” Ferry swore, “which it held more than two feet above the surface of the water, resembled a horse. . . . It had . . . a long white mane that hung down from the neck to the surface of the water. Beside the head and neck, we saw seven or eight folds or coils of this Snake, which was very thick . . . there was about [6 feet] distance between each fold.”

What did Ferry and his men see? It is interesting to speculate, as did skeptical naturalist Henry Lee: “The supposed coils of the serpent’s body present exactly the appearance of eight porpoises following each other in a line. This is a well-known habit of some of the smaller cetacea.”⁸⁴ (I have seen this effect, and it is shockingly compelling. More likely suspects, however, would be the seals common to the Norwegian coast.) In any event, “the horse-like features of the sea-serpent’s head were common knowledge,” as folklorist Michel Meurger notes. “Therefore, Ferry’s assertion is proof only of a traditional interpretation of a sighting he had six years prior to his official statement. This is too long a time to have a fresh recollection but more than enough time to blend memories with collective stereotypes.”⁸⁵

The real importance of Ferry's story is its subsequent role as a template. This widely publicized, often-translated, and precedent-setting sighting was the first credible eyewitness account to reach beyond Scandinavia, and it helped to lock in the canonical image of the sea serpent for the English-speaking world: multiple humps or coils, combined with the head and mane of a horse.

In the centuries since the publication of *The Natural History of Norway*, Pontoppidan has often been criticized for his credulity. "Indeed," wrote Heuvelmans, "the Bishop of Bergen was treated as a liar as arrant as Münchhausen."⁸⁶ Other critics have been kinder. "The Norwegian Bishop," granted Lee, "was a conscientious and painstaking investigator, and the tone of his writings is neither that of an intentional deceiver nor of an incautious dupe. He diligently endeavoured to separate the truth from the cloud of error and fiction by which it was obscured; and in this he was to a great extent successful."⁸⁷ I have argued that quite a bit of Pontoppidan's work can be regarded as early "scientific skepticism."⁸⁸ He advocated for science literacy, pointedly critiquing his clerical brethren for "supercilious neglect" of knowledge of the physical world. Pontoppidan even went out of his way to investigate and correct popular falsehoods, such as the idea that bottomless whirlpools penetrate through the entire Earth and the already ancient legend that the Barnacle Goose hatches out of trees or rotten wood.

Pontoppidan was no slouch, so it is not surprising that he zeroed in on a key problem for his sea serpent: its cultural specificity:

Before I leave this subject, it may be proper to answer a question that may be put by some people, namely, what reason can be assigned why this Snake of such extraordinary size, &c. should be found in the North sea only? For, according to all accounts from seafaring people, it has never been seen anywhere else. Those who have sailed in other seas in different parts of the globe, have, in their journals, taken particular notice of other Sea-monsters, but not one of them mentions this.⁸⁹

Many societies share the ocean, but only one encounters sea serpents. That is such a screaming, flashing, gigantic red flag that readers may be forgiven if they find Pontoppidan's answer to it unconvincing. He simply asserted that "when the thing is confirmed by unquestionable evidence, and is found to be true," then armchair objections are beside the point. Moreover, Pontoppidan argued that "this objection requires no other answer, than that the Lord of nature disposes of the abodes of his various creatures, in different parts of the globe, according to his wise purposes and designs, the reason of his proceedings cannot,

ought not to be comprehended by us.” This dodge seems to me like the clergyman in Pontoppidan inappropriately pulling rank on the scientist.

THE GREAT SEA SERPENT

Erich Pontoppidan’s book was the critical turning point for the sea serpent: a Scandinavian phenomenon that burst forth onto the world stage to become an enduring part of popular culture. (I can’t help but think of the Swedish pop band ABBA.) To understand what a breakthrough this was, consider Bernard Heuvelmans’s overview of the sighting database (figure 5.18). He estimated that in the centuries before the publication of Pontoppidan’s *Natural History of Norway*, there were only nine dated and documented sightings of sea serpents in all of history. After Pontoppidan? “The number increases to twenty-three between 1751 and 1800 but they do not become really frequent until the first half of the nineteenth century: 166 from 1801 to 1850 and 149 from 1851 to 1900. The rate did not drop in the twentieth century, for there were 194 between 1901 and 1950.” Heuvelmans noted that the trend was continuing in the 1960s, when he compiled the statistics. Assuming that one-third of sightings record misidentification errors or hoaxes, he estimated that “this makes 100 sightings every fifty years, an average of two a year, right up to the present.”⁹⁰

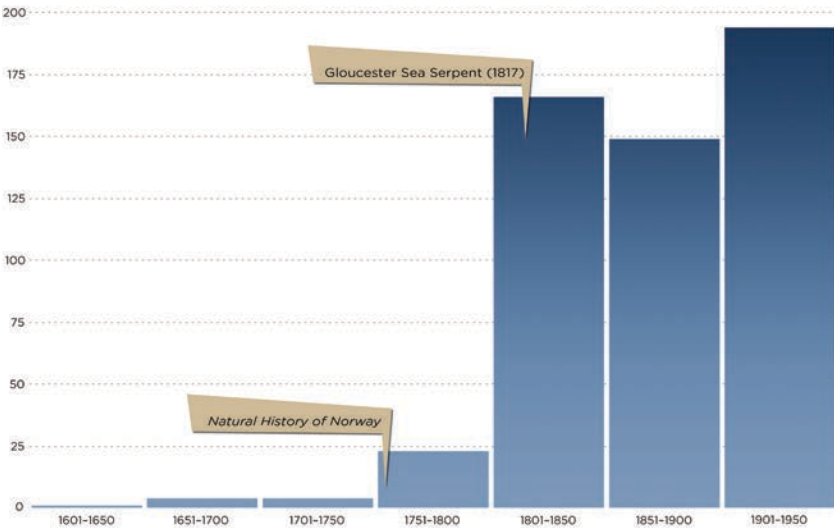


Figure 5.18 Sightings of sea serpents, 1600–1950, by fifty-year intervals, according to Bernard Heuvelmans.

This strikes me as exceptionally funny in two respects. First, Heuvelmans's assumption that two-thirds of claimed sightings are genuine was surely on the optimistic side; after all, it's not known that there has been even one genuine sea serpent sighting—ever. Second, the pattern he described is clearly that of a pop-culture phenomenon. By his own admission, sea serpents basically did not exist before Pontoppidan's book made them famous; since then, they have been seen regularly and increasingly. *The Natural History of Norway* launched the sea serpent to stardom; from there, it entered the self-sustaining fame cycle that perpetuates UFOs, Bigfoot, and other popular mysteries.

The Stronsay Beast

For as long as humans have walked beside the sea, they have marveled at the strange things that sometimes wash ashore. “During the rule of Tiberius, in an island off the coast of the province of Lyons the receding ocean tide left more than 300 monsters at the same time, of marvelous variety and size,” recorded the Roman natural historian Pliny the Elder.⁹¹ Similarly, a pamphlet published in 1674 describes a “Strange Monster or Wonderful Fish” that washed up on a beach in Ireland (figure 5.19). The description and illustration clearly identify the animal as a large squid, 19 feet in length (including the arms) “and in Bulk or Bigness of Body somewhat larger than a Horse.” (The anonymous author of the pamphlet cheekily added that “some Zealots hearing of a strange Creature . . . took it for the Apocaliptical Beast, and fancied the Pope was landed in person.”)⁹²



Figure 5.19

The “Strange Monster or Wonderful Fish” that washed ashore in Ireland in October 1673.

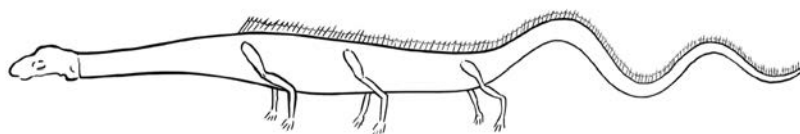


Figure 5.20 The sketch of the Stronsay Beast drawn by an eyewitness. (Redrawn from *Memoirs of the Wernerian Natural History Society* 1 [1811])

With the global publicity for Erich Pontoppidan's sea serpent, strange carcasses took on new meaning. When a huge, vaguely whale-like animal washed up on Stronsa (now called Stronsay, an island off the northern tip of Scotland) in 1808, it was immediately identified as "a sea-snake with a mane like a horse"—and, indeed, the case seemed clear. Reportedly measured at a bulky yet sinuous 55 feet in length, with a long neck and a mane, there seemed little room to doubt that this was a creature unknown to science. Multiple sworn statements and an eyewitness sketch seemed to clinch the case (figure 5.20). And then Scottish naturalist John Barclay stepped in to confirm that it "appeared to be the Soe-Ormen described above half a century ago, by Pontoppidan, in his *Natural History of Norway*," assigning it to a brand-new genus and species: *Halsydrus pontoppidani* (Pontoppidan's sea-snake).⁹³

Alas, nothing was as it seemed. Today, Barclay's *Halsydrus pontoppidani* is remembered alongside *Nessiteras rhombopteryx* (proposed for the Loch Ness monster), *Hydrarchos sillimani* (an alleged fossil sea serpent), and *Cadborosaurus willsi* as a premature taxonomic misstep. The problem? The creature rotting on the Stronsay beach, scavenged by wheeling gulls, was a basking shark. The animal's skull, several vertebrae, and other samples were sent to Everard Home, a surgeon and leading scientist who had recently received the Royal Society of London's prestigious Copley Medal. With these specimens, Home was able to firmly identify the animal as a basking shark and to ascertain that the drawing and descriptions were wildly inaccurate distortions of the anatomy of the carcass. So stark was the discrepancy between the eyewitness testimony and the forensic evidence that the Stronsay Beast has lived on as a cautionary tale. "There can be little doubt that this creature was, actually, an enormous basking-shark, partly decomposed," wrote sea serpent advocate Rupert Gould, "but the original reports are so curious, and the accepted explanation so much at variance with them, that the case deserves more than a cursory mention, if only as an instance of how misleading it is possible for honest testimony to be."⁹⁴

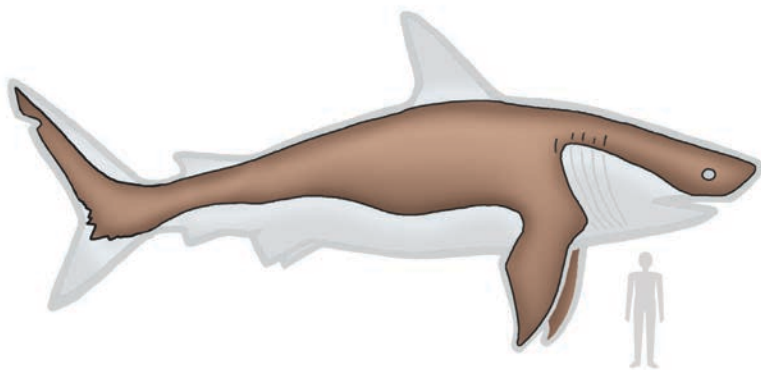


Figure 5.21 It is typical for a decaying basking shark to resemble a plesiosaur. (Illustration by Daniel Loxton)

But was Home's analysis accurate? Barclay did not think so. He published a rebuttal, objecting that the head of a basking shark is 5 feet across, while the skull of the Stronsay Beast was only 7 inches wide. But Barclay had fallen into a trap that has misled people ever since. The huge, gentle basking sharks—like all sharks—have skeletons made of cartilage, rather than bone. Moreover, basking sharks are filter feeders (similar to humpback and other baleen whales). As a result, the pattern of decay in basking shark carcasses can be counterintuitive (figure 5.21). The huge jaws fall off quickly, leaving a surprisingly tiny skull perched at the end of a long spine—looking for all the world like a rotten sea serpent or long-necked plesiosaur. This is what happened to the Stronsay carcass. In the two centuries since the carcass washed ashore, the vertebrae (preserved in museum collections) have been reexamined more than once. Home's findings have been confirmed each time. In 1933, for example, James Ritchie (then professor of natural history at the University of Aberdeen and later president of the Royal Society of Edinburgh) wrote in the *Times* of London about his own conclusions after reexamining the vertebrae of the Stronsay Beast at the Royal Scottish Museum:

They tell their own tale to scientific examination. They are obviously part of the backbone of a gristly fish; by no possibility could they belong to a plesiosaur, or to any reptile or amphibian, nor could they be part of a whale or even of a bony fish. The texture of the segments of the vertebrae, their size, and curious pillared structure, agree exactly with those of the basking shark, a monster which may be 40 ft. long and which occasionally appears in British waters. . . . The sea-serpent of

Stronsay, which a century and a quarter ago raised so great a commotion in the scientific world, has fallen from its unique estate, but it remains a not-to-be-forgotten memorial to the credulity of the inexperienced and of the scientists who built upon so shaky a foundation.⁹⁵

The Stronsay Beast may never have been quite forgotten (at least within the niche sea serpent literature), but its lesson has never been learned. Again and again, people have fallen for the same grisly illusion. High-profile cases continue to arise, with many “sea serpent” or “plesiosaur” carcasses making headlines during the twentieth century—only to prove, time and again, to be basking sharks. A mere three months after Ritchie confirmed that the Stronsay Beast was really a shark, headlines around the world gleefully announced that a similar unidentified carcass (what is now called a “globster” in cryptozoological parlance) had washed up in Cherbourg, France. The *Los Angeles Times* declared it the “First Genuine Sea Monster Captured,” while the front page of the *New York Times* trumpeted that “France Has Sea Monster.”⁹⁶ After several stories on the topic, the *New York Times* made the inevitable retraction: “After a careful examination of the extensive remains of the ‘sea monster’ found on the shore near Cherbourg, Professor [Georges] Petit and his colleagues of the French Museum of Natural History have definitely concluded that this fish is a basking shark.”⁹⁷ This was not the last time this clichéd narrative would play out; bizarrely, it was not even the last time it played out in that year. In November 1934, newspapers from Scotland to Chicago trumpeted the discovery of a 30-foot sea serpent carcass on Henry Island (in British Columbia, Canada). The *New York Times* got right back on that sea horse, reporting that this “strange sea monster” had a “head resembling that of a horse” and no bones except the vertebrae.⁹⁸ Just four days later, the *Times* revealed, predictably, that the director of the Pacific Biological Station in Nanaimo, British Columbia, had positively identified the remains as those of a basking shark.⁹⁹

These misidentifications are among cryptozoology’s silliest banalities, but they are not so passé that they have stopped. The most famous case may be that of the Japanese fishing trawler *Zuiyo Maru*, whose crew in 1977 hauled aboard a badly decomposed carcass from the Pacific Ocean off New Zealand (figure 5.22). Repulsed by the “overpowering stench and the unpleasant fatty liquids oozing onto the deck,” the fishermen photographed the carcass, took tissue samples, and then dumped it overboard.¹⁰⁰ The loss of the specimen



Figure 5.22 The carcass of a basking shark aboard the Japanese fishing trawler *Zuiyo Maru* in 1977. (Reproduced by permission of Fortean Picture Library, Ruthin, Wales)

did not deter the *Los Angeles Times* from excitedly speculating that this reeking, slimy mess could be a relict plesiosaur: “a huge reptile thought to have died out 100 million years ago.”¹⁰¹ But it was not to be. The tissue samples nailed down what was already obvious to anyone with a sense of history: it was a basking shark.¹⁰² Again.

The full-color photographs taken by a member of the crew of the *Zuiyo Maru* fired my imagination as a kid, and clearly I am not alone. The story has never completely faded. I have in my office a fantastic recent Japanese toy that lovingly re-creates the carcass in miniature—a lump of plastic painted to resemble a heap of rotting flesh. But the currency of the story goes beyond cryptozoology-themed collectibles: even today, some believers argue that the carcass truly was that of an extant plesiosaur. In a fairly typical overlap between scientific creationism (the attempt to confirm the literal truth of the account of creation in Genesis—or at least to disprove evolution—through purportedly scientific means) and cryptozoology, an article in the journal of the Creation Research Society argues that “the interpretation of the *Zuiyo Maru* cryptid as a shark is false” and concludes that a “Sauropterygia [plesiosaur or related marine reptile] identification remains viable.”¹⁰³ Cryptozoologically

inclined creationists seem to hope that locating a plesiosaur or another so-called living fossil would pose problems for evolutionary theory, but it is hard to see why a plesiosaur would be more disruptive than the continuing existence of crocodiles and sharks, which first appeared about 220 million and 400 million years ago, respectively. Regardless, keen interest from creationists (and from wide-eyed kids) have ensured that the survival of a relict population of plesiosaurs has remained among cryptozoology's fondest dreams. But how did plesiosaurs emerge as a dominant cryptid, and how do they relate to the hippocamp-based Great Sea Serpent?

The "Plesiosaur Hypothesis"

In their nineteenth-century heyday, sea serpents enjoyed more mainstream scientific respectability than any other cryptid has ever achieved. This high-profile scientific attention was based on a truly spectacular coincidence: just as the sea serpent was reaching the peak of its popularity, new fossil discoveries taught scientists that gigantic marine reptiles genuinely used to exist. In primeval seas, sinuous plesiosaurs and ichthyosaurs swam beside dinosaur-dominated shores (figure 5.23). As the world reflected on a recent rash of sea serpent sightings on the East Coast of North America (especially in and around Gloucester, Massachusetts, in 1817), astonishing fossil finds shone a warm light of plausibility on the modern serpent legend—a spotlight under which the sea serpent thrived.

It is worth taking a moment to picture the English scientific scene as it existed in this pioneering, pre-Darwinian period, vividly evoked by paleontologist Christopher McGowan. Reflecting on the romantic appeal of nineteenth-century geology books, McGowan wrote, "They enchanted me with their accounts of antediluvian creatures. And they spirited me away to their bygone world of Regency and Victorian England. I could picture myself—silk hat and frock coat—perambulating the foreshore of the Dorset coast, searching the cliffs for fossils. Or cabbaging through London's horse-drawn traffic to attend a meeting of gentlemen geologists."¹⁰⁴

Top hats. Meetings by flickering gaslight. Snifters of brandy. In the halls of Oxford, cutting-edge geological lectures still taught that the features of Earth had been carved by Noah's flood. But the world was changing fast: the Age of Steam was dawning, and the brave new science of geology was turning the understanding of the history of Earth on its head. It was becoming clear that

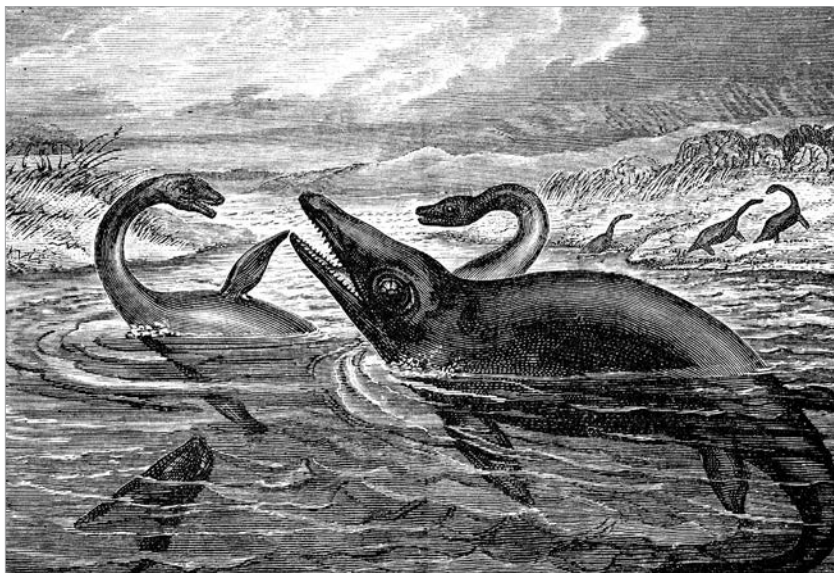


Figure 5.23 Many nineteenth-century artists and writers depicted epic battles between the newly discovered ichthyosaurs and plesiosaurs.

the planet was very, very old—and that life on Earth had been very different in the distant past. In France, the great anatomist Georges Cuvier convincingly argued that some creatures known from fossils (such as mammoths) had vanished entirely from Earth, but other scientists still argued that extinction was incompatible with God's perfection. Perhaps even mammoths had survived in some distant land?¹⁰⁵ And if remnant populations of fossil creatures had hung on in Earth's inaccessible places, they might be very much unchanged, for no convincing mechanism for the "transmutation" (or evolution) of species was yet known.

Onto that stage stepped Mary Anning, a working-class Englishwoman whose sharp eye and sheer physical stamina made her (in an era of gentleman geology) perhaps the greatest fossil collector of her time. She is a romantic figure in the history of science, although she must not have considered herself in that light. I can't help but picture her, walking along seaside cliffs near Lyme Regis, in Dorset, on damp, frigid mornings; kneeling in her long skirts; swinging her rock hammer with her calloused hands and bloodied knuckles—and all for the fossils that she would sell to survive, letting moneyed men take the credit of discovery. Yet, the large marine reptiles whose fossils she found

triggered a stunning upheaval of human understanding of the past. These were creatures utterly unlike anything known. Ichthyosaurs were reptiles with shark-shaped bodies, while plesiosaurs were even weirder: long-necked reptiles that propelled themselves through the water with four paddle-like flippers. Their fossilized remains opened a window onto a lost world, paving the way for Charles Darwin—and incidentally remixing the popular legend of the sea serpent.

By nineteenth-century standards, the ink was hardly dry on newspaper reports of the sea serpent sightings around Gloucester in 1817 when ichthyosaurs were shown to be reptiles in 1821. The first nearly complete plesiosaur skeleton was described in 1824 in a presentation before the Geological Society of London—at the same meeting that announced the first dinosaur genus name: *Megalosaurus*.¹⁰⁶ Almost immediately, naturalists made the connection to sea serpents. In 1827, botanist Sir William Hooker employed the newly discovered plesiosaur and dinosaur fossils as a rhetorical device, asking why it should be, when “the recent discoveries of the Plesiosaurus and Megalosaurus have made demands upon our powers of credence far greater than the serpent, the descriptions of the latter animal have received very little trust, and even much ridicule and contempt.” Hooker went on to argue that, in light of eyewitness testimony, sea serpents may now “be assumed as a sober fact in Natural History. . . . We cannot suppose, that the most ultra-sceptical can now continue to doubt with regard to facts attested by such highly respectable witnesses.”¹⁰⁷

A much more direct argument was advanced in 1833 by geologist Robert Bakewell, who matter-of-factly stated in his textbook *Introduction to Geology*, “I am inclined to believe, that the ichthyosaurus, or some species of a similar genus, is still existing in the present seas.” Bakewell went on, “I remember one of the most particular descriptions of the sea serpent was given by an American captain . . . ; it had paddles somewhat like a turtle, and enormous jaws like the crocodile. This description certainly approaches to, or may be said to correspond with, the ichthyosaurus, of which animal the captain had probably never heard.”¹⁰⁸

In a footnote to Bakewell’s speculation, chemist Benjamin Silliman, a professor at Yale, made the connection that would, a century later, give form to the Loch Ness monster: “Mr. Bakewell’s ingenious conjecture, that it may be a Saurian, agrees, however, much better with the supposition that it is a Plesiosaurus than an Ichthyosaurus, as the short neck of the latter does not cor-

respond with the ordinary appearance of the sea serpent.”¹⁰⁹ The image of the sea serpent as a relict plesiosaur was swiftly taken up by other scientists. In 1835, John Ruggles Cotting noted, “The Sea-serpent, which has frequently visited the waters of New England, is supposed to belong to the genus *Plesiosaurus*. Its existence has been so often attested by thousands of competent witnesses, that its identity is no longer problematical.”¹¹⁰

Living prehistoric monsters. How cool would that be? At a time when the history of life on Earth was very much up for grabs (Darwin’s *On the Origin of Species* was not published until 1859), the possibility that plesiosaurs could (just maybe!) still exist had a powerful fascination for laypeople, journalists, and scientists alike. “The beliefs of the sea-serpent’s supporters were inspired by the fashion of the day,” noted Bernard Heuvelmans. “The discovery of bones of the great saurians in Britain in the first half of the nineteenth century, and in America in the second half, had fired everyone’s imagination.”¹¹¹ Of course, this popular interest had an impact on the form and frequency of reports of sightings of sea monsters. “It was not mere coincidence that as paleontologists began dredging up plesiosaurs and other relics from the past a dramatic increase in sightings of sea serpents also occurred,” deadpans science writer Sherrie Lynne Lyons.¹¹²

Plesiosaurs were, for example, proposed as an explanation for a sighting in 1848 by officers of the British frigate HMS *Daedalus* (figure 5.24). This case had (and still has) a very high profile, thanks to the esteem granted to naval officers and to the crisply worded report to the Admiralty submitted by Captain Peter M’Quhae. (The order of events should be noted at the outset, however. Oddly enough, the log of the *Daedalus* failed to record any hint of a sea serpent.¹¹³ When the *Times* of London nonetheless publicized an alleged sighting from almost three months earlier, the Admiralty understandably demanded details.¹¹⁴ Only at that point did M’Quhae report the alleged sighting to the Admiralty, “in reply to your letter . . . requiring information as to the truth of a statement published in *The Times* newspaper, of a sea-serpent of extraordinary dimensions having been seen from Her Majesty’s ship *Daedalus*.”)¹¹⁵

M’Quhae described a relatively traditional “enormous serpent,” complete with “something like the mane of a horse,” that, with head raised, passed the ship at a moderate distance (close enough to recognize a human acquaintance, according to M’Quhae, or about 200 yards at its closest approach, according to fellow witness Lieutenant Edgar Drummond).¹¹⁶ The *Daedalus* case remains unsolved, but the usual three possibilities exist: a hoax, a mis-

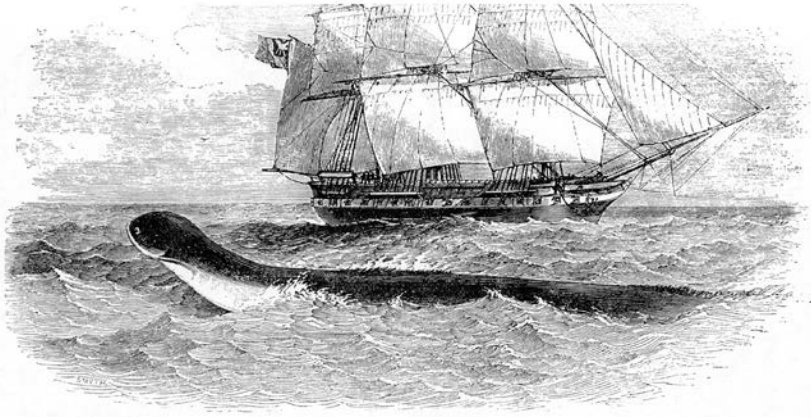


Figure 5.24 The creature reported by officers of the HMS *Daedalus* in 1848.

take, or a genuinely unknown animal. We may regard as naive the argument that “M’Quhae’s honesty was not—and, obviously, could not be—seriously called into question,” as Rupert Gould put it.¹¹⁷ (While a hoax may have struck fans of the Royal Navy as “frankly unthinkable,” skeptics know that hoaxes are uncomfortably common and cross all boundaries of class and occupation. Indeed, another London newspaper published a different sea serpent report less than three weeks after M’Quhae’s, only to learn to its embarrassment that the story was a complete fabrication.)¹¹⁸ Still, most commentators have taken the report of the officers of the *Daedalus* as sincere, in which case the question becomes: What did those men see? Swiftly the suggestion appeared in a letter to the *Times*: “[T]he enormous reptile in question was allied to the gigantic Saurians, hitherto believed only to exist in the fossil state, and, among them, to the Plesiosaurus.”¹¹⁹

The *Daedalus* case became an enduring part of the cryptozoological canon after it attracted a detailed public critique from one of the world’s weightiest scientific authorities: Richard Owen, of the British Museum, who had coined the term “dinosaur” just six years earlier. Owen’s reputation in his field was overpowering (“[H]is opinion on a zoological question has almost the force of an axiom,” as one of his contemporaries put it),¹²⁰ although he was known personally as an unpleasant character. His unrelenting campaign against Darwinian evolution and its supporters, which included a venomous anonymous review of *On the Origin of Species*,¹²¹ led the normally genial Darwin to admit, “I used to be ashamed of hating him so much, but now I will carefully cher-

ish my hatred & contempt to the last days of my life.”¹²² Nonetheless, Owen was an awfully sharp guy, and his critique of the *Daedalus* case stands as one of the clearest skeptical statements on sea serpent mythology. Owen argued, plausibly enough, that M’Quhae may have misidentified an elephant seal or a sea lion. These massive mammals would match fairly closely with M’Quhae’s description of the sea serpent and the drawings he endorsed, but it remains a purely speculative explanation—parsimonious, but unproved. And that is where the mystery remains: a deadlock between Owen’s argument that M’Quhae did not know what he was looking at and M’Quhae’s retort that Owen did not know what he was talking about: “I now assert—neither was it a common seal nor a sea-elephant, its great length and its totally differing physiognomy precluding the possibility.”¹²³

Owen knew that his elephant seal explanation was speculative, but he was sure about one thing: there was no way a living plesiosaur had casually glided past a Royal Navy frigate. His caustic response remains relevant to cryptozoology:

Now, on weighing the question, whether creatures meriting the name of “great sea-serpent” do exist, or whether any of the gigantic marine saurians of the secondary deposits may have continued to live up to the present time, it seems to me less probable that no part of the carcass of such reptiles should have ever been discovered in a recent or unfossilized state, than that men should have been deceived by a cursory view of a partly submerged and rapidly moving animal, which might only be strange to themselves. In other words, I regard the negative evidence, from the utter absence of any of the recent remains of great sea-serpents, krakens, or *Enaliosauria*, as stronger against their actual existence than the positive statements which have hitherto weighed with the public mind in favor of their existence. A larger body of evidence, from eye-witnesses, might be got together in proof of ghosts than of the sea-serpent.¹²⁴

Other scientific superstars were more easily seduced by the possibility of surviving plesiosaurs, including the great geologist and paleontologist Louis Agassiz of Harvard University. Agassiz’s scientific legacy includes the distinction of being among the first to propose a “glacial” period (ice age) in Earth’s history. Less well known is his advocacy for the sea serpent as a prehistoric survivor. Agassiz touched on the topic in a lecture he gave in March 1849:

I have asked myself . . . whether there is not such an animal as the Sea-Serpent. There are many who will doubt the existence of such a creature until it can be

brought under the dissecting-knife; but it has been seen by so many on whom we may rely, that it is wrong to doubt any longer. The truth is, however, that if a naturalist had to sketch the outlines of an Ichthyosaurus or Plesiosaurus from the remains we have of them, he would make a drawing very similar to the Sea-Serpent as it has been described. . . . I still consider it probable that it will be the good fortune of some person on the coast of Norway or North America to find a living representative of this type of reptile, which is thought to have died out.¹²⁵

Agassiz amplified this opinion in a letter written on June 15, 1849, concluding that while he was “not at all disposed to endorse all the reports” of sea serpent sightings, “from the evidence I have received I can no longer doubt the existence of some large marine reptile, allied to Ichthyosaurus and Plesiosaurus, yet unknown to naturalists.”¹²⁶

An example of this new type of sighting, of an overtly plesiosaur-like creature, is that reported from the HMS *Fly*, described by Edward Newman, editor of the journal *Zoologist*, in 1849:

Captain the Hon. George Hope states, that when in H.M.S. *Fly*, in the gulf of California, the sea being perfectly calm and transparent, he saw at the bottom a large marine animal, with the head and general figure of the alligator, except that the neck was much longer, and that instead of legs the creature had four large flappers, somewhat like those of turtles . . . the creature was distinctly visible, and all its movements could be observed with ease: it appeared to be pursuing its prey at the bottom of the sea.¹²⁷

In 1959, cryptozoology pioneer Willy Ley characterized the *Fly* report as “very significant, in my opinion,”¹²⁸ but it is hard to see why he would have thought so. As Ley noted, the case was “deplorably lacking in detail,” but it was worse than that: the story was unsubstantiated hearsay. As Newman put it, “Captain Hope made this relation in company, and as a matter of conversation: when I heard it from the gentleman to whom it was narrated [emphasis added], I inquired.” That is, Newman heard from an unnamed source that Hope had mentioned socially that he once saw a weird-looking animal. Not a lot to hang your hat on—but, oddly enough, Newman went on to argue that the *Fly* case “appears to me in all respects the most interesting Natural-History fact of the present century, completely overturning as it does some of the most favourite and fashionable hypotheses of geological science.”¹²⁹ Despite its weaknesses, the report remained influential because it seemed to confirm a hypothesis that many people wished to be true.

Wishful thinking did not, however, stop one later supporter of the “plesiosaur hypothesis,” Rupert Gould, from pointing out the flaws in the story that Newman and others had ignored: “If the matter were so important, why (one wonders) did not Newman get into touch with Captain Hope and obtain a first-hand version of his experience (preferably in writing): with, if possible, some confirmatory evidence? As it stands, the most remarkable feature of the story is the absence of such elementary data as the time, place, and date of the occurrence.”¹³⁰ A century after the sighting, Gould made the effort to track down the ship’s log and the details of Hope’s career. When a lieutenant, Hope had indeed served on the *Fly*, ten years before Newman heard the monster tale at second hand—but there is no record of any monster sighting. As Gould summed up, “It does not appear that the creature was seen by anyone except Hope” (if it was seen at all); thus the tale “cannot be regarded as carrying very much weight.” Indeed.

The *Fly* tale does show both the influence of the new fossil discoveries, introducing a second culturally available major template for the sea serpent—a competitor to the classic hippocamp-based form—and the expansion of the geographic range of alleged sea serpent habitat. No longer constrained to the North Atlantic, let alone to the coasts of Norway, by 1849 the sea serpent had successfully established itself in the congenial waters off California.

The idea that sea serpents were members of a relict population of plesiosaurs continued to gain traction, with acclaimed science writer Philip Henry Gosse making a high-profile pitch for the idea. “I express my own confident persuasion,” he concluded, “that there exists some oceanic animal of immense proportions, which has not yet been received into the category of scientific zoology; and my strong opinion, that it possesses close affinities with the fossil *Enaliosauria* [extinct marine reptiles, including plesiosaurs].”¹³¹ This was hardly the most extraordinary proposal of his career. Gosse is best remembered for his (now widely mocked) book *Omphalos: An Attempt to Untie the Geological Knot*, in which he attempted to unify the new findings of geology with his own biblical literalism by supposing that God had created the living world with built-in evidence of a past that had never existed. (Gosse was correct, in one sense: such fictive prior history is implicit in the whole concept of instantaneous creation.)¹³² With this creationist argument as his unfortunate legacy, it is easy to forget that Gosse stood, in his own lifetime, among the premier writers of popular science. Stephen Jay Gould described him as “the David Attenborough of his day, Britain’s finest popular narrator of na-

ture's fascination."¹³³ Gosse was especially respected on topics related to marine life. He was among the first to experiment with saltwater "aquariums"—a word he popularized with his books on the topic, inspiring both the household hobby and the tourist industry of marine-animal exhibition parks.¹³⁴

While noting the need for skepticism, especially about eyewitness testimony ("every man of science must have met with numberless cases in which statements egregiously false have been made to him in the most perfect good faith; his informant implicitly believing that he was simply telling what he had seen with his own eyes"),¹³⁵ Gosse was persuaded that sightings of sea serpents established their existence. We need not rely, he felt, purely on speculation about the possibility of surviving prehistoric animals. "On this point," he wrote, "actual testimony exists, to which I cannot but attach a very great value." What testimony? That same old bit of unsupported hearsay, the report of George Hope of the *Fly*!

Gosse addressed Richard Owen's objections to the "plesiosaur hypothesis" (in short, that there are no plesiosaur carcasses today or any plesiosaur bones in the fossil record after the end of the reign of the dinosaurs). Like modern Bigfooters, Gosse argued that the absence of modern remains is consistent with the existence of modern plesiosaurs. (Surely their carcasses would sink. And even if one of these rare animals were to wash up on a remote shore, who would recognize it?) He also maintained that the negative evidence of the fossil record was hardly a deal breaker. Those who know Gosse's name only in association with disreputable creationist arguments may be surprised that he approvingly cited Charles Darwin:¹³⁶

It must not be forgotten, as Mr. Darwin has ably insisted, that the specimens we possess of fossil organisms are very far indeed from being a complete series. They are rather fragments accidentally preserved, by favouring circumstances, in an almost total wreck. The *Enaliosauria*, particularly abundant in the secondary epoch, may have become sufficiently scarce in the tertiary to have no representative in these preserved fragmentary collections, and yet not have been absolutely extinct.¹³⁷

Even more surprising, perhaps, Gosse rested his sea serpent case on an evolutionary argument!

Not that I would identify the animals seen with the actual *Plesiosaurs* of the lias. None of them yet discovered appear to exceed thirty-five feet in length, which is scarcely half sufficient to meet the exigencies of the case. I should not look for any species, scarcely even any genus, to be perpetuated from the oolitic period to the

present. Admitting the actual continuation of the order *Enaliosauria*, it would be, I think, quite in conformity with general analogy to find important generic modifications, probably combining some salient features of several extinct forms. Thus the little known *Pliosaur* had many of the peculiarities of the *Plesiosaur*, without its extraordinarily elongated neck, while it vastly exceeded it in dimensions. What if the existing form should be essentially a *Plesiosaur*, with the colossal magnitude of a *Pliosaur*?¹³⁸

With popular-science writers like Gosse behind it, it is not surprising that popular entertainment also embraced the idea of the sea serpent. As do their present-day descendants, early science-fiction writers looked to dramatic scientific discoveries for storytelling possibilities—and plesiosaurs and ichthyosaurs were as dramatic as they come. In Jules Verne's novel *Journey to the Center of the Earth* (1864), for example, protagonists clinging to a raft on a secret underground sea witness a battle between "the most formidable of antediluvian reptiles, the ichthyosaurus," and "a serpent disguised by a shell like a turtle's, the terrible enemy of the first, the plesiosaurus."¹³⁹ Modern human characters likewise see or interact with surviving plesiosaurs in Arthur Conan Doyle's novel *The Lost World* (1912) and Edgar Rice Burroughs's tale *The Land That Time Forgot* (1918), in which the crew of a German U-boat finds plesiosaur steaks delicious.¹⁴⁰

The theme was further advanced by Rupert Gould, who argued that—despite his criticism of Hope's report from the *Fly*—the eyewitness evidence supports as many as three types of undiscovered species. Foremost among them is a gigantic creature "much resembling in outline and structure the *Plesiosaurus* of Mesozoic times." Echoing Gosse, Gould invoked evolution to make his case: "I do not suggest that the last-named is actually a *Plesiosaurus*, but that it is either one of its descendants or has evolved along similar lines. In either case, I suggest that there is little doubt that it has much the same characteristics—a slender neck and tail and a comparatively large body with propelling flippers."¹⁴¹

The "plesiosaur hypothesis" remained popular throughout the twentieth century, coexisting with the hippocamp-like sea serpent. Dramatically different though these two major types of sea serpents may be, they morph easily into each other throughout the world's seas and monster lakes—with witnesses dipping liberally into both culturally available templates on a case-by-case basis. Consequently, reports and reconstructions offer no end of hybridized

monsters, including plesiosaurs with manes, plesiosaur-headed serpents, and plesiosaurs with an improbable series of coil-mimicking humps on their backs. The Loch Ness monster, for example, comes in all these forms and more (including straight-up traditional sea serpents), despite Nessie's status as poster girl for the plesiosaur-survivor mythology.

Hydrarchos: 114-Foot Fossil Sea Serpent?

The discoveries of fossilized plesiosaurs and other extinct marine reptiles in the nineteenth century led to an enduring new subcategory of plesiosaur-like sea monsters and yet also boosted the profile of the traditional hippocamp-style sea serpent. Of all the dramatic fossil evidence to support the sea serpent's apparent plausibility, nothing was quite so stupendous—or quite so on the nose—as the fossil reconstruction of a creature dubbed *Hydrarchos sillimani* (figure 5.25). According to its discoverer, Albert Koch, it was nothing less than the bones of the sea serpent itself. Reconstructed in a hippocamp-like posture—massive head rearing high above fore-flippers, body arching, and tail curling—it could hardly be anything else. Or could it?

This intensely hyped skeleton of a “GIGANTIC FOSSIL REPTILE 114 Feet in Length” (as the advertisement screamed) was exhibited in New York

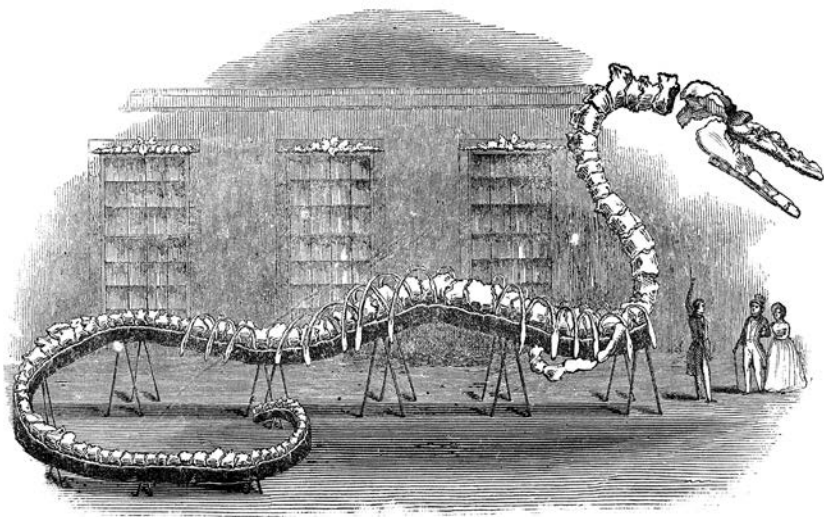


Figure 5.25 The chimera fossil assemblage that Albert Koch dubbed *Hydrarchos sillimani*.

City in 1845, in the Apollo Rooms on lower Broadway (a large saloon that had hosted the debut of the New York Philharmonic three years earlier). Crowds flocked to pay 25 cents (children half price!) to see the fossil sea serpent.¹⁴² This amounted to a tidy fortune. Consider that New Yorkers were then paying 4 cents for a quart of milk.¹⁴³ The press was as gobsmacked as the crowds. The *New York Daily Tribune* hailed it as “indisputably the greatest wonder that ever was brought to light out of the strata which form the crust of our globe”—and a lasting monument to American greatness.¹⁴⁴ Alas, not all was as it seemed.

Commercial fossil collector “Doctor” Albert Koch was a colorful figure: a successful and important fossil hunter, a shameless self-promoter, and (most of all) a hustler of the first order. His previous major fossil find, likewise profitably toured and hyped, was presented to the world as *Missourium*, “the Missouri Leviathan”—a web-footed, aquatic predator that had once lurked in the rivers and lakes of Missouri. According to Koch’s analysis of his newly unearthed creature, *Missourium* was remarkable for its hard armor (on which no “barbed iron, harpoon, or spear, would make any impression”) and its “enormous magnitude, ferocity, and strength, as well as fleetness in swimming.” Its “fleetness in swimming” may well have been overstated, however, for despite Koch’s colorful assertions (and the several extra ribs and vertebrae he had added to his specimen), *Missourium* was in fact an American mastodon. (Nonetheless, it was a very nice American mastodon. The British Museum knew exactly what it was buying when it snapped up the skeleton in 1843 for a whopping £1,300.¹⁴⁵ Anatomist and sea serpent skeptic Richard Owen promptly restored the skeleton to its rightful anatomy. It still stands in the Natural History Museum in London, properly identified as a mastodon.)¹⁴⁶

When Koch revealed as his next big trick that he had personally discovered definitive proof of a 114-foot sea serpent, it drew crowds—but also scrutiny. *Hydrarchos* seemed too good to be true. And, indeed, it was.

Jeffries Wyman, a professor of anatomy at Harvard, examined the massive skeleton during its New York exhibition and saw immediately that something was wrong. He communicated his findings to the Boston Society of Natural History. First, it was clear from the double-rooted teeth that the jaws of *Hydrarchos* belonged to a mammal, not a reptile. This identification slammed the scientific door on the sea serpent pretensions, but it wasn’t the worst of it. It was clear to Wyman that the vertebral column was cobbled together from “a series of bones which could never have belonged to the same individual, as

is obvious from the fact that they manifest different degrees of ossification, and must, therefore, have belonged to individuals of different ages.”¹⁴⁷ As a final humiliation, Wyman discovered that the hippocamp-like paddles were at least partly constructed “not of bones, but of casts of the cavities of a cam-erated shell, a species of *Nautilus*. . . . These could not fail to strike the eye at a glance, when examined by any one acquainted with the forms of fossil nauti-loid shells.” Ouch. *Hydrachos* was not an animal, but a chimera—a sculptural creation that combined bones from multiple fossil animals. It was assembled from several specimens of an extinct whale (now called *Basilosaurus*).

If the problems were this obvious to any trained eye, does this expose Koch as merely incompetent or as a deliberate fraud? The jury remains somewhat split on the question of Koch’s competence. One modern historian cautions, “To dismiss Albert Koch . . . as simply one of the more ingenious showmen of his day would be unfair. Koch appears to have been a keen observer of geolog-ic phenomena and a competent natural historian, although he was not profes-sionally trained.”¹⁴⁸ Others have been less kind. In particular, geologist James Dwight Dana of Yale was ferociously critical of Koch, writing that his papers collectively “sustain the conclusion that Dr. Koch knew almost nothing of ge-ology, and that what he gradually picked up from intercourse with geologists he generally made much use of, but seldom was able to use rightly. In zoolog-ical knowledge he was equally deficient.”¹⁴⁹

Regardless of Koch’s level of competence, two truths stand out: his fossil finds were genuinely spectacular, and he was intentionally deceptive about those finds. “Dr. Koch was a man of large pretensions,” said Dana, concluding that “Koch appreciated the absurdity” of his claims, but made them anyway “merely to get a full house” of paying customers for his exhibits.¹⁵⁰ Dana sin-gled out as evidence Koch’s willingness to improbably assert that *Missourium* was the inspiration for the biblical Leviathan—and then turn around with a straight face and publicize the notion that Leviathan was based on *Hydrachos*!

Following up on his original exposé of *Hydrachos*, Wyman explained in a letter to a colleague that “Dr. Koch, who by the way is no doctor, is a shrewd man [and] knows very well that few are sufficiently acquainted with bones to give an opinion as to the nature of the beast,”¹⁵¹ and asked for further infor-mation to help him determine the true origin of the fossil whale bones from which Koch’s sea serpent had been constructed. Koch had asserted that all the bones had been found together in a life-like assembly, but Wyman’s dis-covery that they came from multiple individuals showed Koch’s yarn to be “a

mere fabrication” (as was the judgment of the Boston Society of Natural History). Sure enough, Wyman’s findings were confirmed by Dr. Lister, a resident of the area where Koch had found the bones. Lister investigated, informing the Boston scientists,

Dr. Koch found a considerable portion of the bones now constituting the *Hydrachos*, lying upon, or near, the surface of the earth. They were not lying in their natural position, so as to constitute an unbroken series, but were scattered here and there. Some days after finding some of the bones of the anterior extremities, and some ribs and vertebra . . . [h]e also procured others of the bones in Clark county, at a place twenty miles distant, and some wagonloads of them at another place seven miles distant from the spot where he got the most interesting part of them.¹⁵²

Interestingly, much of this story is corroborated by no less an inside source than Koch himself. His travel diaries describe his discovery of the largest cache of incomplete bones that would be used to create *Hydrachos*: “After the softer parts had decomposed, the bones were lying for some time unpetrified . . . individual bones of the skeleton suffered displacement; indeed, a part of the ribs, the foot bones and several of the tail vertebrae were lost completely.” Although loosely arranged in a “sort of half-circle,” the remaining bones were damaged and scattered, with the surviving portions of the head “completely turned around”; nonetheless, Koch was confident that “of the whole so much existed that the missing parts could be replaced artificially.”¹⁵³ And, as we now know, that is what he did—artificially, and very creatively, using bones from other locations. (*Basilosaurus* vertebrae were so common in the area, Koch wrote, that he found them built into fireplaces, used to support a garden gate, and even serving “a Negro for a pillow.”)

Even more striking, Koch’s diaries refer to these fossils as belonging to “Zygodon”—a bastardization of *Zeuglodon*, which was another name for *Basilosaurus*. Koch clearly understood from the get-go that *Hydrachos* was not a startling new form of life, but a genus that had been discovered, described, and mounted by other naturalists. Koch’s diaries reveal that he deliberately chose to do his fossil hunting in “the region in Alabama where the big Zygodon is found.”¹⁵⁴ Moreover, Koch’s use of the term “Zygodon” reveals that he knew in advance that his sea serpent was a mammal! The genus *Zeuglodon* was proposed by Richard Owen, whose examination of fossil bones from the inaccurately named *Basilosaurus* (king lizard) in 1839 revealed that “the fossil was a Mammifer of the cetaceous order”—a whale. Just as Wyman found when he examined Koch’s specimen six years later, Owen concluded that the

creature's double-rooted teeth were a dead giveaway. Thus Owen renamed it *Zeuglodon* (yoked tooth).¹⁵⁵

Nonetheless, the bones comprising Koch's so-called sea serpent were rare and valuable. Despite insightful criticisms from European scientists, the assemblage was snapped up by King Friedrich Wilhelm IV of Prussia, who gave Koch a yearly pension for life in order to secure *Hydrarchos* for the Royal Anatomical Museum in Berlin.¹⁵⁶ (Sadly, it was, like so many of Europe's natural and cultural treasures, destroyed during World War II.)¹⁵⁷ Once again, a generous reward for the dishonest "Dr." Albert Koch—the man who, as Robert Silverberg put it, made a "career of creating supermonsters."¹⁵⁸

False-Positive Sightings: Fuel for the Global Legend

Running a case-sensitive Google Ngram search on "sea serpent" and "Sea Serpent," I see without surprise that the frequency of the term in English-language books spiked dramatically in 1849 (in the wake of the *Daedalus* case of 1848), soaring to heights of fame that it would never again attain.¹⁵⁹ This tidal wave of celebrity subsided, but the sea serpent never did recede into obscurity. Having become a truly global legend, sea serpents continued to appear wherever ships sailed and wherever eyes looked out to sea. (Nor was it just saltwater: sea serpents appeared inland as well, slithering into the folklore of freshwater bodies from Lake Erie to Lake Okanagan.)

The sea serpent thrived not only in books and popular culture, but, according to eyewitnesses the world over, also in nature. What, if anything, were all those people seeing? To answer that question, we might stop first to consider an insight or two from the critical literature on other paranormal claims—for, to repeat Richard Owen's insight: "A larger body of evidence, from eyewitnesses, might be got together in proof of ghosts than of the sea-serpent."¹⁶⁰

When considering UFOs, ghosts, Bigfoot, telekinesis, faith healing, and similar elusive, paranormal phenomena, advocates must grapple with the two fundamental vulnerabilities of eyewitness-dependent cases: people lie, and people make mistakes. Traditionally, advocates for these phenomena have responded with a "where there's smoke, there's fire" argument:

- There are many eyewitness encounters.
- It is unreasonable to suppose that lies or mistakes are so extremely common as to account for all encounters.
- Therefore, some of the paranormal encounters record genuine paranormal events.

But as population geneticist George Price explained in 1955 in a widely read article, this argument is backward. Price's criticisms focused on fraud in research on extrasensory perception (ESP), but his arguments apply just as well to sightings of sea serpents:

When we consider the possibility of fraud, almost invariably we think of particular individuals and ask ourselves whether it is possible that this particular man, this Professor X, could be dishonest. The probability seems small, but the procedure is incorrect. The correct procedure is to consider that we very likely would not have heard of Professor X at all except for his psychic findings. Accordingly, the probability of interest to us is the probability of there having been anywhere in the world, among its more than 2 billion inhabitants, a few people with the desire and ability to produce false evidence for the supernatural.¹⁶¹

We have seen that deliberate fraud by both witnesses and investigators is a serious (perhaps crippling) problem for cryptozoology, but let's set aside fraud for the moment. Price's argument also goes to the issue of false-positive misidentification errors. As with fraud, cryptozoologists often argue, in essence, that a reasonable observer in a given eyewitness case would not have mistaken an ordinary phenomenon or animal for a cryptid. This retort to skeptics is typical: "[T]he men who see sea-serpents are familiar with seals, and . . . are not likely to make such mistakes."¹⁶² By extension, if many reasonable observers report having seen cryptids, a significant percentage of those sightings should be genuine. Right? Not so fast.

As Price pointed out in regard to ESP researchers, this argument approaches the evidence from the wrong end. Those who claim to have seen cryptids are not randomly selected average observers. They are among the few people who, out of the billions of people on Earth, have already filtered themselves into the minuscule outlier population of those *who claim to have seen cryptids*. Even ignoring the issue of fraud, we run into the Law of Large Numbers: given large enough numbers, very unlikely things become inevitable. (As Michael Shermer has often observed, "The Law of Large Numbers guarantees that one-in-a-million miracles happen 295 times a day in America.")¹⁶³ We could grant the dubious assertion that people in general are decent observers—we could even unrealistically suppose that almost everyone is accurate almost all the time—and we would still expect some small percentage of the population to mistake ordinary animals, objects, or events for cryptozoological creatures. This becomes an inevitability simply because so many billions of people see so many billions of things.

As it happens, however, there is no need to rely on theoretical arguments and certainly no need to speculate. As with other cryptids, there are many records of false-positive sightings of sea serpents. Let's look at a few of these documented misidentifications and their variety of causes.

- *Smaller animals*: It is important to recognize that eyewitnesses do not usually report having seen animals shaped like serpents. Instead, they describe a series of discrete coils, humps, or dark rounded objects ("like a string of buoys" is typical)¹⁶⁴ and infer that they are connected beneath the water's surface. The problem, of course, is that such sightings are by their nature ambiguous: a humungous serpentine animal might resemble a string of buoys, but a group of smaller individual objects (say, an actual string of buoys) also might resemble a string of buoys. For this reason, seals, sea lions, dolphins, porpoises, and waterfowl have always been obvious sources for false-positive sea serpent sightings. Edward Newman noted in 1864 that the large groups of barrel-like harp seals common to Norwegian waters could easily generate reports of sea serpent sightings:

These were very fond of swimming in line, their heads alone above water, engaged in a game of "follow-my-leader"; for on the first seal making a roll over, or a spring into the air, each seal of the whole, procession, on arriving at the same spot, did the like, and exactly in the same manner. While viewing this singular proceeding (and I had many opportunities of doing so), I could not but be struck with the plausibility of one of the suggested explanations of the appearance which has obtained so widespread a notoriety under the name of the "great sea serpent." . . . I could quite understand any person, not an unromantic naturalist, on witnessing for the first time such a sight as I have tried to describe, honestly believing that the mythical monster was actually before his eyes.¹⁶⁵

Newman was correct: pods of seals are mistaken for sea serpents. In one example cited by Cadborosaurus advocates Paul LeBlond and Edward Bousfield, two British Columbia police officers observed a "huge sea serpent with a horse-like head"—only to discover, using binoculars, that the "serpent" was actually a group of seven sea lions. "Their undulations as they swam appeared to form a continuous body," reported the *Province*, "with parts showing at intervals as they surfaced and dived. To the naked eye, the sight perfectly impersonated a sea monster."¹⁶⁶

Likewise, groups of dolphins or porpoises may also impersonate sea serpents. Proponents of monsters are often scornful of this explanation

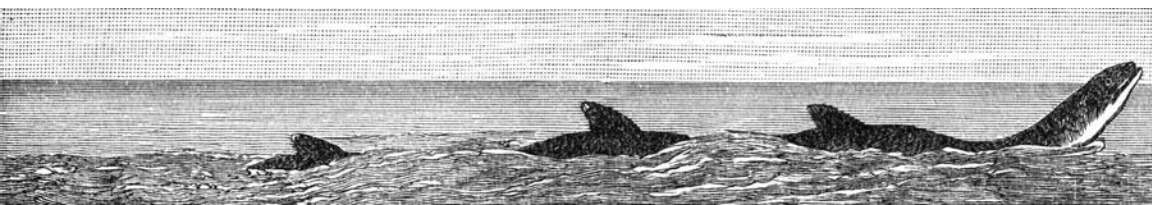


Figure 5.26 The sea serpent sighted from the *St. Olaf* near Galveston, Texas—"about two minutes" after a school of sharks passed the ship.

(which Willy Ley called "one of the favorite 'explanations' of many people who do not take the time to acquaint themselves" with the evidence),¹⁶⁷ but I have seen this illusion. Sitting in a window seat of the tiny ferry that carries foot passengers between Seattle, Washington, and Victoria, British Columbia, I saw *Cadborosaurus* in broad daylight. When I noticed its rolling coils, my heart leaped into my throat. There I was, a "professional skeptic," and I wanted to shout out loud. It was only with sustained observation that I was able to break down the illusion—and even then, my brain kept *trying* to interpret those porpoises as a sea serpent. The school of porpoises in Puget Sound looked exceedingly similar to a sketch made in 1872 after a sighting in the Gulf of Mexico near Galveston, Texas (figure 5.26). According to Captain Hassel of the three-masted *St. Olaf*, a school of sharks passed under the stern of his ship, and about two minutes later the crew spotted a 70-foot sea serpent. However, the sketch of the "serpent" shows three or four distinct, rounded objects—each with its own prominent triangular dorsal fin! That positively screams porpoise, dolphin, or shark—all of which are found in the region. (Assuming, of course, that it happened at all. A. C. Oudemans wrote of this case: "I don't know whether the following . . . is a true hoax or an optical illusion, but I think it is a hoax.")¹⁶⁸

From the perspective of many cryptozoologists, these "group of *X* swimming in a line" explanations seem forced. "If so many otters around the world are 'swimming in a line' to fool eyewitnesses into thinking they are the loops of Sea Serpents or Lake Monsters, where are all of the photographs of such visual demonstrations?" asked Loren Coleman.¹⁶⁹ Going for the pun, Coleman called the theory "otterly ridiculous"—only to post a photograph suggested by fellow cryptozoologist John Kirk a week later, acknowledging that "now I've been sent a clear instance where this behav-

ior has been observed and photographed.”¹⁷⁰ Naturalists observe such behavior in many species, but it is largely beside the point: the illusion does not depend on the animals moving in a line, but merely moving in any clustered group. This is one of the least appreciated important facts relevant to the sea serpent literature: thanks to perspectival effects, *any distant cluster of objects at sea appears as a line when viewed from near sea level*, as from a small boat or the shoreline. It is an effect that you can observe on your kitchen table. Just plunk down some small objects in a random-looking cluster at one end of the table, and then bend down to view the scene from the other end in edge-on perspective. I just did this with some blobs of modeling clay: presto, a sea serpent (figure 5.27). Many animals swim on the water’s surface in groups, from otters to ducks to dolphins. Given perspective, many of them will appear sea serpent-like; therefore, it’s predictable that some witnesses will believe that they have seen sea serpents



Figure 5.27 When viewed from a low angle (as from a boat or beach), any loose cluster of distant objects on the water’s surface appears serpent-like. The effect is demonstrated with blobs of modeling clay on a kitchen table, photographed first from a high angle (*top*) and then from a low, edge-on angle (*bottom*). (Photographs by Daniel Loxton)

when in fact they have not. And, again, we need not rely on theory; this effect is well documented within cryptozoology. Consider, for example, Nessie witness Alex Campbell's misperception of a flock of birds:

I discovered that what I took to be the Monster was nothing more than a few cormorants, and what seemed to be the head was a cormorant standing in the water and flapping its wings as they often do. The other cormorants, which were strung out in a line behind the leading bird, looked in the poor light and at first glance just like the body or humps of the Monster, as it has been described by various witnesses.¹⁷¹

It is tempting to suppose that while groups of sea lions or other animals may be mistaken for sea serpents, the illusion cannot last more for than an instant. After all, in the examples just cited, weren't the witnesses able to pierce the illusion themselves? But mistakes of this kind are not always so ephemeral, according to Ian McTaggart-Cowan. In 1950, while a professor in the Department of Zoology at the University of British Columbia,¹⁷² McTaggart-Cowan explained to *Maclean's* that he had seen this illusion convince people, persist, and then make press as genuine sightings of the Pacific Northwest sea serpent, *Cadborosaurus*: "On two occasions I saw what was reported to be Caddy," says Cowan. "In each case Caddy consisted of a bull sea lion with two others following it. I must admit that they looked convincingly like a sea serpent and you could hardly blame an untrained person for not recognizing them as sea lions. Each time the papers came out the next day with reports that Caddy had been seen."¹⁷³

- *Seaweed*: The idea that anyone could mistake ordinary, inert seaweed for a living monster has been widely mocked. "It will not be necessary to point out that this hypothesis is not deserving of any notice on our part," huffed Oudemans.¹⁷⁴ The argument that seaweed cannot explain all sea serpent reports is true and yet trivial. No one on any side of cryptozoology should be looking for a single explanation. A cryptid is not a single animal to be identified—either *this*, or else *that*—but an umbrella under which diverse reports are grouped. It's just barely possible that genuine sightings of new creatures may be among the evidence collected under those umbrellas; if so, they must huddle alongside many false positives, generated by a very wide range of phenomena.

One of the known sources of erroneous reports of sea serpents is seaweed, of which heroically proportioned, serpentine pieces can be found drifting throughout the world's oceans. Nor is it only landlubbers who

make the elementary-seeming error of mistaking algae for monsters. Groups of experienced sailors have made exactly this mistake (and in broad daylight, at that). In 1849, for example, Captain J. A. Herriman of the *Brazilian* sighted what was clearly a sea serpent through his telescope. This huge and lively creature swam with its head held high. The mane running down its neck was as clear as its forked tail. Herriman called over an officer and several passengers—all of whom, “after surveying the object for some time, came to the unanimous conclusion that it must be the sea-serpent” that had been widely publicized in recent news. Herriman grabbed a harpoon and ordered a boat into the water in pursuit:

The combat, however, was not attended with the danger which those on board apprehended, for on coming close to the object it was found to be nothing more than an immense piece of sea-weed, evidently detached from a coral reef, and drifting with the current, which sets constantly to the westward in this latitude, and which, together with the swell . . . gave it the sinuous snakelike motion.¹⁷⁵

It’s important to reflect how history would have recorded this account if Herriman had not ordered the pursuit. Without the opportunity to “capture” the seaweed, this would stand as an important, sustained sighting in broad daylight by multiple witnesses—including experienced sailors.

The case of the *Brazilian* is in no sense unique. In 1858, Captain Smith of the *Pekin* shared a nearly identical experience (said to have occurred in 1848).¹⁷⁶ “With the telescope,” Smith recalled, “we could plainly discern a huge head and neck, covered with a long shaggy-looking kind of mane, which it kept lifting at intervals out of the water. This was seen by all hands, and declared to be the great sea-serpent.” Smith dispatched a boat to hunt the monster. When the sailors hauled the creature on board, they were shocked to discover that it was (of course) just seaweed. Once again, seasoned mariners had mistaken ordinary seaweed for a monster in broad daylight. “So like a living monster did this appear,” Smith warned, “that, had circumstances prevented my sending a boat to it, I should certainly have believed I had seen the great sea-serpent.”¹⁷⁷

There is even a dramatic case in which armed forces apparently opened fire on drifting seaweed. According to the recollection of Captain J. H. Taylor, a government official responsible for India’s important Madras Harbor,

About fifteen years ago . . . an enormous monster, as it appeared, was seen drifting, or advancing itself . . . into the Harbour. It was more than one hundred feet

in length, and moved with an undulating snake-like motion. Its head was crowned with what appeared to be long hair, and the keen-sighted among the affrighted observers declared they could see its eyes and distinguish its features. The military were called out, and a brisk fire poured into it at a distance of about five hundred yards. It was hit several times, and portions of it knocked off. So serious were its evident injuries, that on its rounding the point it became quite still, and boats went off to examine it and complete its destruction. It was found to be a specimen of the sea-weed above mentioned, and its stillness after the grievous injuries inflicted was due to its having left the ground swell and entered the quiet waters of the Bay.¹⁷⁸

- *Boat wakes and waves*: It is extremely telling that sea serpents are so often spotted in calm water. As Erich Pontoppidan put it in 1755, “It is never seen on the surface of the water, but in the greatest calm”¹⁷⁹—an observation that many other writers and witnesses have repeated since that time. “Evidently the animals feel comfortable in fine weather and when there is no wind,” concluded Oudemans, citing dozens of cases in which these conditions were described.¹⁸⁰ This circumstance is so common that some have even argued that sea serpents may be too fragile to withstand waves or wind.

Of course, calm water also provides perfect conditions for mistaking boat wakes for sea serpents. Many skeptical writers fall prey to the temptation to champion one or another prosaic explanation for monster sightings. Naturalist Henry Lee interpreted virtually all important sea serpent cases as misidentifications of giant squid. I strongly recommend against such silver-bullet explanations—false sea serpent sightings clearly emerge from a wide variety of phenomena—but I am convinced that boat wakes are an underappreciated cause. Given calm water and the right light, the characteristic V-shaped waves left by passing boats or ships can create an extremely compelling illusion. As the two wake lines diverge, each can appear as a series of sinuously animated, dark-colored humps that travel with apparent purpose. Few people realize how far boat wakes can travel. Witnesses may spot wakes miles from their point of origin, with no boats nearby or even anywhere in sight, thus leading to the conclusion that they have seen a sea serpent. Nor is it just boat wakes that can resemble sea serpents; natural waves can also create this effect. Because waves are, well, waves, they interact—some canceling each other, some reinforcing each

other (a bit like the famous “double bounce” familiar to kids with trampolines). Even in relatively calm water, natural waves can sometimes stand out, serpent-like, from their surroundings. And, of course, natural waves also interact with boat wakes.

I am persuaded that many popular monster books include photographs or descriptions of boat wakes. Indeed, it would be surprising if they did not. Next time you are near a marina or beach (or reading a monster book), keep your eye out for this illusion. It does not take long to spot waves that could convince a reasonable observer under some circumstances that he or she has just seen a sea serpent. Remember, a given source of false positives need not seem persuasive to most people under most circumstances. Imagine that boat wakes fooled only 1 in 100,000 people, 1 in 1 million, or even 1 in 100 million. Wakes and waves need convince only a handful of people a year in order to become a major part of monster lore!

CADBOROSAURUS: THE GREAT SEA SERPENT OF THE NORTHWEST

The Great Sea Serpent may seem like a mystery from a bygone era—a legend that faded out of fashion alongside top hats and buggy whips. But while it may have enjoyed its greatest surge of scientific interest and public belief during the Age of Steam, the traditional sea serpent is still spotted. Even today, cryptozoologists seek proof of the existence of these “aquatic mega-serpents.”

The best-known modern iteration of the hippocamp-inspired Norwegian serpent is seen not in the North Atlantic off Europe, but in the Pacific Northwest of North America (figure 5.28). This Victorian legend swam into the twentieth century, suitably enough, off the Canadian city of Victoria (at the southernmost tip of Vancouver Island). The provincial capital of British Columbia, Victoria is a bustling tourist destination with a busy cruise-ship port. Today it bills itself as the City of Gardens, but in 1933 it enjoyed worldwide fame for something altogether more mysterious—nothing less than an 80-foot sea monster. According to legend, it was an awesome, primeval monster: a huge serpent with fore-flippers, a lobed tail, a mane, and a head something like that of a camel or horse. But how did that legend get started? Why would anyone suppose that a monster out of time would slide undetected through the frigid waters off British Columbia and Washington State? That question hinges on a moment in history.



Figure 5.28 The horse- or camel-like head of the maned *Cadborosaurus willsi*. (Illustration by Daniel Loxton)

Imagine yourself in 1933. The Great Depression was causing tremendous hardship at home. As Archie Wills, editor of the *Victoria Daily Times* recalled, a trip to Ottawa

let me see first hand the devastating effect of the Depression across the country. In Ottawa; close to Parliament Hill, men slept in the open and panhandled for money. As we travelled by train we saw thousands of youths riding the rails, crammed into box cars; seeking work when there was none anywhere. I saw . . . homeless families. I saw youths in Kamloops searching for any kind of food under [a railway] bridge. I was shocked at the conditions.¹⁸¹

The news from overseas was just as grim. Daily newspaper headlines carried ever more bad news about Adolf Hitler. As tensions continued to mount between the new Nazi government and the rest of Europe, war seemed increasingly likely.

“After my return to Victoria during this troublesome period,” Wills continued, “it occurred to me that we should try to inject a bit of humor in the

newspaper. Rumors were abroad that a sea serpent was disporting itself in our waters and I felt if the story was handled circumspectly we might have a little fun.”¹⁸² Wills was forthright about his motivations for publicizing the serpent (people needed a pick-me-up to balance all the bad news, and, not incidentally, the newspaper needed the money),¹⁸³ but he was hardly the first newspaper editor to turn to the sea serpent in an hour of need. As the *Critic* put it in 1885:

There is a difference between a policeman and a sea-serpent. It is a familiar saying that you can never find a policeman when you want him. But whenever the sea-serpent is needed he comes up smiling, at the very moment when the editor, short of a topic, has sent his Sister Anne into the look-out to see if she can descry a “sensation” in the distance. No stronger proof could be asked of the high intelligence and self-sacrificing good-nature of these aquatic ophidians than the precision with which they inform themselves as to the exact date when the Silly Season has set in.¹⁸⁴

In a 1950 interview, Wills went so far as to say, “Caddy’s a psychologist.” The too-perfect timing was “significant,” hinted Wills, adding, “We certainly needed distraction then.”¹⁸⁵

With the *Victoria Daily Times* backing the 1933 serpent story, Cadborosaurus, as the paper dubbed the creature (or Caddy, for Cadboro Bay, allegedly a favorite haunt for the creature), became a media darling, making headlines from London to Los Angeles, from the *New York Times* to *Time*.¹⁸⁶ But how did the traditional Atlantic sea serpent take up residence in the Pacific? Assuming that Wills did not invent it from whole cloth, how did the “rumors” about the serpent get started? And why, then, in 1933—the same year that Nessie was born?

My strong suspicion is that Cadborosaurus may have been inspired by the film *King Kong* and, even more so, by the global press surrounding the recent monster innovation at Loch Ness in Scotland—which was itself based on *King Kong*. Let’s look at how events unfolded.

According to Wills, it literally began on a slow news day. “One morning things were dull in the newsroom of The Times,” Wills recalled. “The police court reporter had returned from his beat without record of even a drunk. In his despair he blurted out: ‘A couple of guys say they’ve seen a sea serpent off Cadboro Bay. What about that for a headline?’”¹⁸⁷ Wills dispatched reporter Ted Fox to talk first to witness W. H. Langley and then to another man, Fred W. Kemp.¹⁸⁸ The next day’s front-page headline proclaimed, “Yachtsmen Tell

of Huge Serpent Seen off Victoria.”¹⁸⁹ This seized the imagination of the city, inspiring a rash of copycat sightings and launching an enduring legend.

Both Langley and Kemp claimed that they had seen huge sea monsters, allegedly in independent sightings over a year apart. According to Langley, he and his wife were sailing when they heard “a grunt and a snort accompanied by a huge hiss,” and then “saw a huge object about 90 to 100 feet off,” of which “the only part of it that we saw was a huge dome of what was apparently a portion of its back.” It was, he said, visible for only a few seconds before diving. Contemporary critics were quick to point out that it swam like a whale, sounded like a whale, and looked like a whale. Langley disputed this interpretation,¹⁹⁰ but whales do abound in the area: humpback whales, gray whales, sperm whales, and others. Given that no other evidence corroborates this momentary, undeniably whale-like anecdote, the Langleys’ sighting seems to be a completely trivial case.

Kemp’s sustained daylight sighting was more interesting. According to Kemp, he and his family were picnicking one afternoon in 1932, on one of a group of tiny islands just off Victoria, when they saw something extraordinary. A huge creature swam up the channel between Chatham and Strongtide islands, leaving an impressive wake. In a signed statement, Kemp recalled,

The channel at this point is about 500 yards wide. Swimming to the steep rocks of the island opposite, the creature shot its head out of the water on to the rock, and moving its head from side to side, appeared to be taking its bearings. Then fold after fold of its body came to the surface. Towards the tail it appeared serrated, like the cutting edge of a saw, with something moving flail-like at the extreme end. The movements were like those of a crocodile. Around the head appeared a sort of mane, which drifted round the body like kelp.¹⁹¹

Kemp estimated that the animal was more than 60 feet long. Although it was indistinct with distance—it was at least 1,200 feet away, maybe 1,500—this was no fleeting sighting. According to Kemp, he and his family watched the monster for several minutes before it slid off the rocks and swam away.

What was it? It seems to me like a group of sea lions among the distant kelp, viewed at too great a distance and interpreted with too great a dollop of imagination. The interesting question is: Whose imagination?

Kemp’s description may provide a clue. Despite the copycat sightings and editorial assumptions that gave *Cadborosaurus* its canonical appearance as a hippocamp-type sea serpent, and despite Kemp’s inclusion of the traditional

“mane . . . like kelp,” his description was as much like that of a dinosaur as a sea serpent. The wash thrown up by the monster, he said, gave the impression that it was “more reptile than serpent to make so much displacement.” He added, “It did not seem to belong to the present scheme of things, but rather to the Long Ago when the world was young.”¹⁹²

Responding to the Kemps’ sighting, one letter to the editor of the *Victoria Daily Times* offered an opinion that Caddy might be a sauropod dinosaur called *Diplodocus*. The writer noted Caddy’s long neck and long tail, and called it “probable that it has legs with webbed feet with which it propels itself.”¹⁹³ Kemp seized on the dinosaur idea with enthusiasm: “*Diplodocus* describes better what we saw than anything else. My first feelings on viewing the creature were of being transferred to a prehistoric period when all sorts of hideous creatures abounded.” He said that the creature’s movements “were not fishlike, but rather more like the movement of a huge lizard.”¹⁹⁴ Kemp drew a sketch of the half-submerged monster that was consistent with the appearance of a sauropod: long neck, rounded body, and long tail (figure 5.29). He explained that “the body must have been very bulky. From the movements I firmly believe the creature had flippers or some kind of legs.”¹⁹⁵

This combination of elements—a swimming sauropod dinosaur and the notion of being transported to a prehistoric world full of terrible monsters—is very familiar. It is reminiscent of another sauropod swimming in another

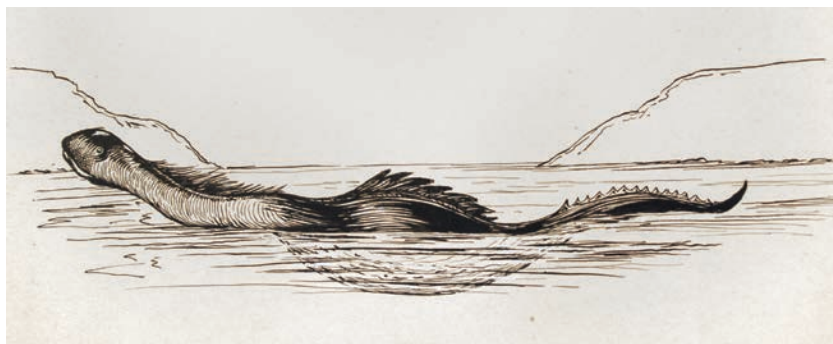


Figure 5.29 The “huge lizard” reported by Fred Kemp. (This drawing, done in 1933, is identified in Archie Wills’s notes as having been “made by an artist,” but it closely resembles a rougher sketch identified as “Mr. Kemp’s original sketch,” in Bruce S. Ingram, “The Loch Ness Monster Paralleled in Canada, ‘Cadborosaurus,’” *Illustrated London News*, January 6, 1934.) (Image courtesy of University of Victoria Archives, Archie H. Wills fonds [AR394, 4.3]; see also “Caddy,” *Victoria Daily Times*, October 20, 1933)

primal environment teeming with hideous creatures: the *Diplodocus* or *Apatosaurus* (formerly *Brontosaurus*) that attacks the crew of the *Venture* on King Kong's perilous Skull Island!

We have seen that the legend of the Loch Ness monster was created immediately after the release of *King Kong* and that George Spicer's key Nessie sighting seems to have been lifted from that film. Could the movie also have inspired Kemp's Cadborosaurus story? The time line certainly works: *King Kong*, it happens, opened in Victoria on May 20, 1933—less than five months before the birth of Cadborosaurus.¹⁹⁶ It blew away moviegoers, scared the socks off viewers, and stuck in the memories of all who saw it. The similarity between Caddy and *Kong* may not be a smoking gun, but it is certainly suspicious.

If Kemp's sighting story was sincere, it may well have been influenced by the film. After all, he told no one about his astonishing brush with a gigantic super-monster at the time that it allegedly occurred—speaking up only the following year, months after the release of *King Kong*. His sighting, he admitted, was extremely uncertain because of the tremendous distance involved. He could not make out the key details. For example, the creature's head was just a blob. If the sighting occurred at all, it is likely that he saw a distant group of marine mammals swimming and climbing on the rocks (as is entirely typical in the area) and plausible that Hollywood may have contaminated his already vague impressions of what he had seen.

If, however, the story was completely invented at a date close to its first publication, the influence of the recently screened *King Kong* would be even easier to explain. (There are thin but tantalizing hints that the case could be a hoax. In 1950, for example, *Maclean's* quoted Kemp as claiming that Cadborosaurus had super-speed: "I wouldn't like to say how fast he travels, people might laugh.' But he added under persuasion, 'Only a bullet would travel anywhere near as fast!'"¹⁹⁷ There's also Wills's recollection, "We convinced several noted citizens to lend their names to a story stating they had seen the marine creature."¹⁹⁸ This probably refers to the reluctance of sincere witnesses to go on record, although Wills did make this remark in the context of generating a media sensation on purpose. For now, I will assume that Kemp's story was probably sincere, although, of course, completely anecdotal.)

Where does this leave Cadborosaurus? Could it be that the entire legendary edifice—the subsequent sightings, the books and television programs, the public sculpture, and the place in popular culture—rests on a foundation of smoke and the flickering screen of a cinema?

Caddy as a Going Concern

Questionable as Caddy's origin story may be, enthusiasts continue to advocate for and seek the creature, which means that the hippocamp-type Great Sea Serpent of the North Atlantic remains a going concern in cryptozoology. This may come as a surprise to some readers, but there it is.

An effort called CaddyScan, for example, uses digital-camera traps to record passing wildlife in the hope of catching evidence of Cadborosaurus. The British Columbia Scientific Cryptozoology Club (of which I am a member) records and reports on new sightings as they come in. Honestly, I dig all that. As a lifelong Cadborosaurus fan, I find myself pleased that people are still searching. I also find it easy to appreciate the reasons—good and bad—that people find the mystery compelling.

To start with one of the weakest, it is occasionally pointed out in the monster's defense that Caddy was included in the *Guide to Marine Life of British Columbia*, published by the Royal British Columbia Museum. Written by G. Clifford Carl, the guide does indeed include Cadborosaurus, but the minuscule listing is clearly tongue in cheek. (Caddy's total length is described as "variable, depending upon circumstances or condition of observer," while its status is listed as "Questionable.")¹⁹⁹ This humorous approach is not surprising. As Archie Wills said, recalling his deliberate manufacture of a popular-culture monster legend, "Even Dr. Clifford Carl, director of the Provincial Museum, went along with the idea; knowing that world-wide coverage would prove beneficial to Victoria's tourist trade."²⁰⁰ As Maclean's described him, Carl was a fan of the Caddy character (call him a willful agnostic), but hardly a believer in its biological reality: "'I'm all for Caddy myself,' says Dr. Carl. 'I don't want to see him (or her, or it, or them) exposed. And if Caddy by some strange chance does actually exist it would be a pity to capture him, stuff him and put him on view in some museum.'"²⁰¹ (In fact, Carl created one light-hearted Caddy hoax himself. When the *Victoria Daily Times* offered a cash reward for a photograph of Caddy in 1951, the first, comically fake entry came from Carl.)²⁰²

A much better argument is that sea monsters are inherently plausible in light of both the available habitat and the fossil record. There's an awful lot of ocean out there—room to hide any number of large aquatic creatures and *perhaps* even air-breathing vertebrates. The rates of discovery for new species can be plausibly extrapolated to estimate the number of discoveries remaining to be made, although not with any great certainty. For example, when

applying various means of extrapolation to the question, “How many extant pinniped species [seals and relatives] remain to be described?” Michael Woodley, Darren Naish, and Hugh Shanahan arrived at estimates as high as fifteen and as low as zero.²⁰³ (The number of pinnipeds left to be discovered is especially relevant because the mainstream of cryptozoological thought now favors the hypothesis that undiscovered, long-necked seals lie behind many sea serpent sightings.) Finally, the coincidence that mosasaurs, plesiosaurs, and other large marine reptiles existed in the geologic past remains as seductive today as it was in 1848.

Another reason that the argument for the existence of *Cadborosaurus* appears compelling is that sightings continue. In 2010, for example, cryptozoologist John Kirk reported a personal sighting of a *Cadborosaurus* with a cow-like head swimming in the wide Fraser River (within a few miles of the point where the Fraser empties into the Strait of Georgia, near Vancouver).²⁰⁴ Also in 2010, reports emerged of a tightly guarded video of *Cadborosaurus* that became part of the reality-television series *Alaskan Monster Hunt*.²⁰⁵ As flimsy as it may appear to skeptics, the continuing accumulation of eyewitness accounts builds up to a “mountain of evidence” that proponents find unparsimonious to reject. (Skeptics may bend over backward to explain all these cases, runs the argument, but c’mon! Surely the simplest explanation is that these people saw what they said they saw!) Here we must note once again that many people do mistake ordinary phenomena for sea serpents and repeat Richard Owen’s observation that a “larger body of evidence, from eye-witnesses, might be got together in proof of ghosts than of the sea-serpent.”²⁰⁶ Mountains of anecdotal testimony exist for many paranormal beliefs that cryptozoologists would reject—but, of course, this does nothing to make anecdotes in favor of their own favorite mysteries seem less compelling.

For those who pursue *Cadborosaurus*, however, the most powerful piece of evidence is something known as the Naden Harbour carcass (figure 5.30). Found in 1937 in the stomach of a sperm whale processed at the Naden Harbour Whaling Station in Haida Gwaii (a large cluster of Canadian islands near the Alaska Panhandle that were known as the Queen Charlotte Islands until 2010), this long, unidentified biological specimen seemed odd to the whalers. They photographed the specimen. As a result of those photographs, generations of cryptozoologists and critics alike have been compelled to share the whalers’ impression: it looks really weird. Moreover—and this has sailed, if not a thousand ships, at least some flights of fancy—it looks somewhat like



Figure 5.30 The unidentified carcass recovered from the stomach of a sperm whale at the Naden Harbour Whaling Station in Haida Gwaii in 1937. (Image I-61404 courtesy of Royal BC Museum, BC Archives)

Cadborosaurus. Or, rather, it looks superficially similar to the features that the hypothetical Cadborosaurus is alleged to possess—the features of a hippocamp.

In 1992, that resemblance provoked leading Cadborosaurus proponents Edward Bousfield and Paul LeBlond to formally propose in a scientific paper that the Naden Harbour carcass be considered the type specimen for a new species to be recognized as *Cadborosaurus willsi*.²⁰⁷ Although this naming followed the lead of Clifford Carl, whose *Guide to Marine Life of British Columbia* had jokingly dubbed the creature “Cadborosaurus (Wills),” Bousfield and LeBlond were widely criticized for having taken this step. Despite being friendly to cryptozoology in principle, paleontologist and science writer Darren Naish pointed out that this taxonomic leap put the cart before the sea horse:

Firstly, establishing a new species on the basis of a photo is just not acceptable: article 72(c)(v) of the International Code of Zoological Nomenclature states that the actual specimen figured or described, and not the illustration or description, must serve as the holotype. The name *Cadborosaurus willsi*, based on a photograph and not the specimen it depicts, therefore has no official standing and should be ignored.²⁰⁸

Worse, according to Naish, was that “the number of speculations that Bousfield and LeBlond included within the paper are inappropriate for a work masquerading as a technical description, never mind the fact that those speculations were fantastic and logically flawed.” Naish noted some oddities that also had leaped out at me. According to Bousfield and LeBlond, Caddy’s very long body (which should have a lot of drag as it moves through the water and, therefore, be slow) can be reconciled with the extremely high speeds attributed to it by witnesses if it bunches itself up into a series of loops that approximate the torpedo shape of a tuna. They also speculated that the beast’s famous (hippocamp-based) mane may be “some gill-like, gas-exchange organ” able to extract oxygen from the water.²⁰⁹ A neat trick for an animal that Bousfield and LeBlond believe is a reptile—and an outright guess. “If these proposals sound nonsensical, or just extremely speculative and lacking in justification,” Naish concluded, “that’s because they are.”

Many cryptozoologists, though, applaud Bousfield and LeBlond for their forward-looking vision; even skeptics acknowledge that the risks they have taken require some serious guts.²¹⁰ But why speculate at all? If the Naden Harbour carcass can settle the case, so much the better. So . . . where is it now? Well, that’s the problem. As LeBlond and Bousfield made clear in 1995, “Exactly how the carcass was disposed of or whether any part of it was preserved is not known.”²¹¹ One lead suggests that it was sent to the Pacific Biological Station at Nanaimo, British Columbia. However, LeBlond and Bousfield found that “nobody there knows anything about it.” Another possibility is that it was sent to the Royal British Columbia Museum in Victoria, as the *Los Angeles Times* reported in 1937.²¹² When I contacted the museum to follow up on this lead, Jim Cosgrove had to disappoint me:

The fact is, we have no record of ever having received the specimen in the photograph from Naden Harbour nor do we have any record of the examination of the specimen or who would have done the necropsy. Lastly, we have no record of how the specimen was disposed of. Nothing appears in any of the Museum’s annual reports which were often remarkable documents of the previous year’s activities. In short we have no records of this specimen at all.²¹³

And that’s it. That’s the beginning and end of the case of the Naden Harbour carcass. Without the carcass (or material from it), there is no way to identify it.²¹⁴ Cryptozoologists do not know what it was, as much as they would like to; I do not know what it was, for all that I wish I did. Could the photograph really show the carcass of a genuine Cadborosaurus? Sure. Why not? Unfortunately,

it is lost to history. If, indeed, it was a Cadborosaurus, we can only mourn for the lost opportunity and hope that it comes again.

The Nature of Cadborosaurus

Why did Cadborosaurus appear in 1933? Local factors had to align to make it happen (Archie Wills's personal creativity and sense of humor, economic hardship, and, of course, proximity to the water), but the release of *King Kong* and the resulting emergence of the Loch Ness monster earlier that year no doubt primed the pump.

But why did Caddy take the form that it did? On the simplest level, the nature of *Cadborosaurus willsi* is obvious: it is fakelore, a manufactured legend, an entertainment product created by regional media. (There is even a bogus Indian legend associated with the story.)²¹⁵ On a deeper level, Caddy became a genuine cryptid—genuine in that people “see” it, making it a living part of twenty-first-century folk belief. And, at the deepest level, it is a modern descendant of the classical Greek artistic motif: the hippocamp.

Caddy's namesake, Archie Wills (dubbed “Victoria newspaperman and fish story expert” by the Associated Press),²¹⁶ conceived a popular mystery, and then he made it happen. Although he maintained a winking ambiguity in his writing, there is good reason to suspect that Wills did not believe in the serpent's literal reality. When the *New York Sun* put the question to Wills directly, for example, he dodged—and yet also said it all. “It is not my function to dispute these eyewitnesses or to erect barriers impugning them,” Wills answered. “News is news. The story attaching to this particular sea serpent belongs to *The [Victoria Daily] Times* wherever it turns up. When Caddy goes out of his way to call at this port, we shall continue to treat him as front page material for all he is worth.”²¹⁷ When Paul LeBlond and John Sibert contacted Wills in 1970 to solicit his help in building a scientific case for the creature, Wills politely responded that “the best success is found in writing stories with ‘tongue in cheek.’ I have always found that ‘Caddy’ appeared here when morale was low, for instance, in 1933, when the Depression was bad.” Wills wished the men “good luck in your quest for knowledge,” but warned, “In view of the fact that you wish to be factual and actually prove the existence of the species, maybe my collaboration would be a handicap.”²¹⁸

Be that as it may, Wills deserves his reputation as Caddy's godfather. As a result of the publicity he gave it, many other people certainly do believe in Cadborosaurus. And as skeptics know all too well, believing is seeing.

“Expectant attention” has been known by psychologists since the nineteenth century, and its role in the paranormal has been discussed since at least 1852 (when William Carpenter invoked the combination of expectant attention and what he coined as “the ideo-motor principle” in order to explain the action of dowsing rods).²¹⁹ Cryptozoologists acknowledge this problem. As Loren Coleman and Patrick Huyghe explained, the human propensity for simple mistakes of perception is amplified by “psychological contagion—if people are told to look for monsters, they will see them.”²²⁰ The Caddy database contains fairly obvious hoaxes (such as the yarn that Jack Nord told about shooting at a 110-foot serpent with 8-inch fangs at a range of a mere 35 yards),²²¹ but also many sincere sighting reports. We have looked at several sources of false-positive misidentification errors—such as sea lions, waterfowl, seaweed, and boat wakes—and I may add just one more: elephant seals. Sometimes found in the waters (and on the beaches) off Victoria,²²² these 16-foot giants are rarely seen and unfamiliar to most locals, and they bear an intriguing resemblance to the hypothetical Cadborosaurus. Depending on ambient conditions, they may appear black, brown, gray, or even green, and (most interestingly) the bulbous noses of male elephant seals give them an exaggerated, camel-like profile.

But neither elephant seals nor boat wakes explain why the canonical Caddy takes the form it does. Eyewitness reports of Cadborosaurus are highly variable (up to and including the claim that “‘Caddy’ has three heads”),²²³ which is to be expected from a mixed population of witnesses interpreting a wide variety of phenomena through the multiple lenses of modern sea monster mythology, Hollywood, and their own imaginations. Nonetheless, the influence of the classical hippocamp on Cadborosaurus is very clear.

Anatomically, the canonical Caddy is extremely similar to the hippocamp: snaky and horse-headed, with a lobed tail like a whale, vertical tail arches, and two fore-flippers below the base of the neck. Caddy’s improbable mane so obviously resembles that of the hippocamp that I find it hard to regard these features as anything other than cultural homologues—which neatly explains something that has puzzled me since I was a child. (The hippocamp template is even clearer when looking at a Caddy-inspired children’s book about a sea serpent named Serendipity, which was very popular among children of my generation. As author Stephen Cosgrove told me, Serendipity’s design borrows “a whole lot of Caddy. I think she is related on her mother’s side.”)²²⁴

But what of Caddy’s famous camel-shaped head? Wills argued on a television program in 1950 that Caddy “is not a horse-face[d] sea serpent like some

inventions of the past, but has a camel-like head.”²²⁵ Doesn’t this distance Caddy from the hippocamp? Not really. “Camel-like” is a minor variation on the traditional “horse-headed” characteristic, and the shape of sea serpents’ heads have always been said to resemble those of a variety of large terrestrial mammals: the hippocamp-descended “horse-like” head dominates, but “cow” and “sheep” are common variants, and even “giraffe” shows up from time to time. For their part, those who claim to have seen Cadborosaurus also use a range of animal comparisons to describe their monster. But contrary to the creature’s camel-headed reputation, “horse-like” is by far the most common description for Caddy’s head! When Darren Naish, Michael Woodley, and Cameron McCormick broke down the 178 eyewitness reports recorded by LeBlond and Bousfield in their book *Cadborosaurus*, they found an astonishing range of descriptions. The witnesses mentioned body lengths of anywhere from 5 to 300 feet, for example, and practically any natural-seeming color from tans to blacks to greens. But the descriptions that the witnesses gave of Caddy’s head are much more uniform: about 75 percent compared it with that of a large animal; of those, a whopping 42 percent said that Caddy’s head looked like that of a horse, and about 13 percent chose the next most popular description: “camel-like.” Combined, the closely similar head-shape descriptions of “horse,” “camel,” “giraffe,” “cow,” and “sheep” comfortably dominated, with a majority of almost 70 percent.²²⁶

The continuing influence of the horse-headed hippocamp template seems clear. Yet, it is also true that sea monster reports are as wildly unpredictable as the sea—and as kaleidoscopically varied as the human imagination.

AN EMBARRASSMENT OF SERPENTS

Writing in 1893, the great English biologist Thomas Henry Huxley (known to history as “Darwin’s Bulldog”) paused to consider the mystery of the Great Sea Serpent. Huxley was a major thought leader in his day (he coined the word “agnostic”), so it pleases me to credit him with one of the most important critical comments ever offered in regard to sea serpents—and, indeed, to paranormal claims in general. Like skeptic Richard Owen before him, Huxley granted that there was “no *a priori* reason that I know of why snake-bodied reptiles, from 50 ft. long and upwards, should not disport themselves in our seas, as they did in those of the cretaceous epoch, which, geologically speaking, is a mere yesterday.” But Huxley saw a serious problem in the way that eyewitness testimony was used to support belief in the serpent. After reading

one compelling eyewitness case, “I was almost convinced,” he wrote—until he compared the testimony with that of a second witness. It became clear “beyond doubt that the circumstance under which the first deponent saw the apparition were such as to make it impossible that he could have properly assured himself of the facts to which he testified. He had done what we are all tempted to do—mixed up observations and conclusions from them, as if they rested on the same foundation.”²²⁷ This is a subtle but powerful point. When people say that they saw a sea serpent or any other cryptid (or a ghost, Elvis, or an Ivory-Billed Woodpecker), what they mean—or *should* mean if they were to take Huxley’s caution to heart—is that they saw a phenomenon that looked a certain way, *and also* they think it may have been a sea serpent.

Cryptozoology thrives on the failure to distinguish observations from conclusions. The inappropriate certainty that people feel for their conclusions is itself treated as primary evidence. Few things in cryptozoology feel as hair-raisingly persuasive as “I was there! *I know what I saw.*” The problem is that different people “know” that they have seen many very different things. Taken at face value, then, the eyewitness evidence implies the existence of many very different types of undiscovered sea monsters—indeed, many competing monsters in every cryptozoological subcategory. (For example, cryptozoologists Loren Coleman and Patrick Huyghe report more than fifty kinds of just bipedal, humanoid cryptids as described by different witnesses at different times.)²²⁸

This exuberant proliferation of monsters posed a challenge for the “author zero” of the modern sea serpent mythology, Bishop Erich Pontoppidan. Discussing an earlier sighting of a sea monster described by clerics Hans and Poul Egede (figure 5.31),²²⁹ Pontoppidan was forced to “conclude (what by other accounts I have thought probable) that there are sea snakes, like other fish, of different sorts.”²³⁰ This was honest of him. Rather than annexing Egede’s quite different monster in service of his own maned Norwegian serpent, Pontoppidan itemized the many points of difference and dubbed it a new species. But he could not stop there. Pontoppidan was likewise forced to admit the existence of other sea monsters: the vast kraken 1½ miles in diameter—and even mermen! How could he not? In his own diocese were “several hundreds of persons of credit and reputation, who affirm, with the strongest assurance, that they have seen this kind of creature,” and he personally spoke with many of these highly certain merman eyewitnesses.

As the sea serpent concept spread beyond Scandinavia, new yarns covered the range from unlikely to implausible to flat-out ridiculous—and each story

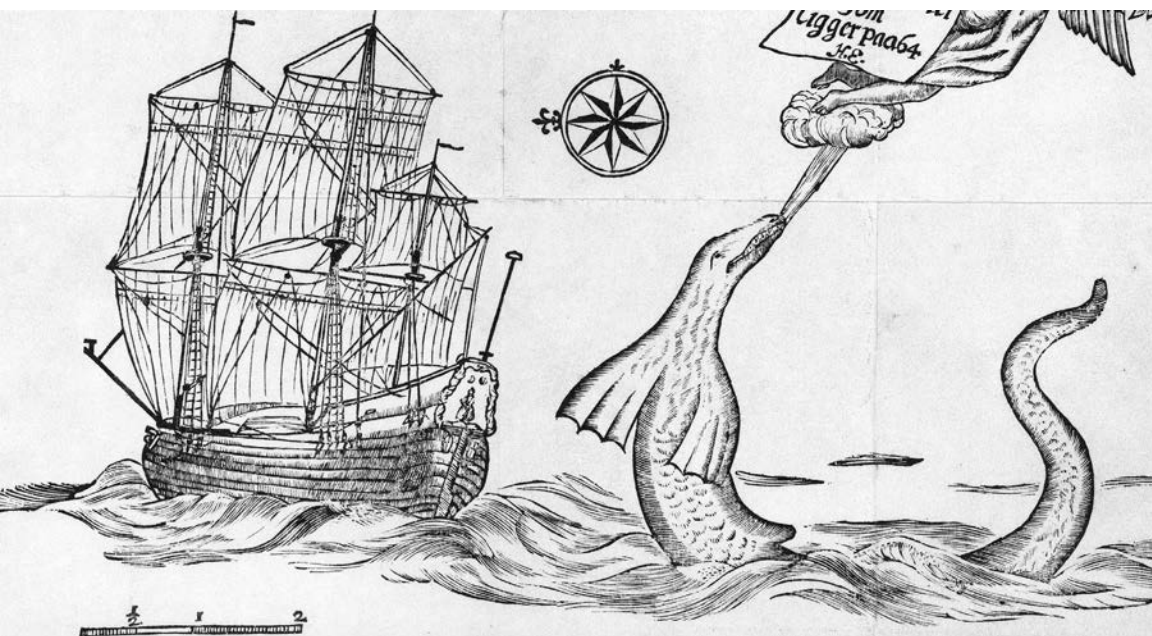


Figure 5.31 A detail from a map, showing the widely reproduced (and frequently re-drawn) illustration of the somewhat whale-like sea monster described by Hans Egede and his son Poul.

jarred against others. In 1786, for example, a newspaper reported that two sailors had sworn before a magistrate and a justice of the peace that they had seen a monster “at least three English miles” in length.²³¹ (Even in those days, this was a bit much to swallow. A rival newspaper soon mocked that this “droll fish” had been killed and that a colossal lead kettle was being constructed to boil it.)²³² A 3-mile monster is clearly an outlier in the sighting database, but the report did involve sworn testimony from multiple witnesses—cryptozoology’s gold standard, such as it is.

This situation would not improve with time. As Charles Gould noted in 1886, “The narratives of different observers disagree so much in detail that we have a difficulty in reconciling them, except upon the supposition that they relate to several distinct creatures . . . the various creatures collectively so designated being neither serpents nor, indeed, always mutually related.”²³³

So variable are eyewitness accounts of sea serpents that Bernard Heuvelmans found it necessary to propose several distinct, undiscovered species of marine mega-fauna: “The legend of the Great Sea-Serpent, then, has arisen

by degrees from chance sightings of a series of large sea-animals that are serpentine in some respect,” including “three Archaeoceti or very primitive Cetecea . . . then two pinnipeds . . . and several eel-like fishes,” and “finally a pelagic saurian shaped like a big crocodile.”²³⁴ Yet, not even this expanded scheme is sufficient to encompass the diversity of eyewitness accounts. Discussing Heuvelmans’s “Merhorse” (hippocampus)-type serpent, Coleman and Huyghe struggled to explain why “observers report several sizes and forms,” invoking sexual variation and regional differences as “probably responsible for the appearance of two distinct categories within the Waterhorse type; one larger and hairier, the other smaller with smoother skin and what appears to be a longer neck in proportion to a slighter body.”²³⁵ Even this level of subdivision glosses over enormous variation. For example, Coleman and Huyghe tentatively folded the Scottish traditions of freshwater water-horses and water-bulls into their two mer-horse subcategories, even though these distinct folkloric creatures are typically described as supernatural, amphibious quadrupeds. (All European water-horse traditions possibly owe something to cultural common descent from the hippocamp, but that does not mean that the multiple traditions are not clearly distinct from one another. The Cadborosaurus-type sea serpent bears extremely little similarity to the shape-shifting kelpies described in the discussion of the Loch Ness monster.)

“Sea-serpents themselves seem to be as variable as fashions,” despaired Heuvelmans.²³⁶ He struggled to make eyewitness reports fit within the classification scheme of his several hypothetical species, but many refused to fit. Many reports described characteristics from more than one of his categories or creatures that fit into none. He wrote, “The problem seems to get more and more confused, as more and more different types of monsters appear, until at times one can almost bear it no longer. I have often felt, during the last seven years, that it was beyond my powers to solve and that I should have to confess myself beaten.”²³⁷ The truth is, he probably should have. Efforts to classify sea serpents (or other cryptids) on the basis of sighting reports are deeply problematic, as Huxley understood in 1893. An insightful article by Charles Paxton compared such efforts to obsessing over the *Monster Manual* from the role-playing game Dungeons and Dragons. Subjectively “shoe-horning” varied reports into preconceived categories is “misleading and can lead to invalid conclusions,” Paxton explained. The monsters of folklore and of eyewitness reports “are not easily classified. They are conceptually amorphous and difficult to define. Fireside tales are not associated with morphological or

zoological precision. Names and characteristics of monsters do not conform to the rigid minds of modern-day cryptozoologists. Snarks overlap with boojums.”²³⁸ Disconnecting cryptozoology from the fundamental fuzziness of eyewitness reports destroys the foundation on which monster hunting rests. According to Paxton’s very good advice, it is best to avoid the temptation even to assign names to cryptids (unless used simply to designate a geographical location, such as “Loch Ness monster”). “The raw data of cryptozoology should not be ‘cryptids’—as many cryptozoologists seem to believe—but *reports*,” Paxton emphasizes. “So when cryptozoologists refer to a particular ‘cryptid’ they really should be referring to a number of reports which may or may not have a common source.”

Does Paxton’s warning about assuming a common source for divergent reports pose a problem for the identification of sea serpents with the hippocamp of classical Greek art? It would if the argument were that witnesses are “really” describing hippocamps, but that is not my position. Instead, I argue, as does Paxton, that myths and legends are amorphous and fluid, with individual storytellers (including eyewitnesses; sincere or not, cryptid reports are ultimately stories) drawing freely from any and all culturally available templates. When witnesses attempt to explain ambiguous phenomena, the hippocamp-derived Great Sea Serpent is one of those available templates. Plesiosaurs are another.

The characteristics of the hippocamp, including the mane and horse’s head, were built into the sea serpent legend at its inception—with the hippocamp inspiring the *hrosshvalr* and *havhest*, these Nordic mer-horses engendering the Scandinavian sea serpent, and the Scandinavian sea serpent informing all that has come since. In this evolution of ideas—“memetic” evolution, to employ biologist Richard Dawkins’s metaphor²³⁹—the hippocamp’s cluster of connected characteristics have allowed it to remain a successful and long-lived creature in the ecology of the imagination. It has evolved slightly since classical times and has come to perform new functions and occupy new habitats, but the hippocamp has remained such a coherent and competitive form that it clearly is echoed in the canonical Cadborosaurus. In parallel with the hippocamp’s line of descent, the discovery of fossils of extinct marine reptiles in the nineteenth century introduced a successful new cluster of dominant traits: those of the small-headed, flippered, long-necked plesiosaur. In the memetic competition taking place in the imaginations of individuals, in popular culture, and in scientific (and pseudoscientific) specu-

lation, ideas may not only change vertically over time, but also trade characteristics horizontally with their competitors. This horizontal meme transfer results in no end of hybridized creatures, as witnesses and storytellers mix and match characteristics from the hippocamp-style Great Sea Serpent, from plesiosaurs, from dragons, from whales and other known animals, and (in memetic evolution's engine of mutation) from mistakes and imagination. In most alleged water monster habitat, serpent types are reported alongside plesiosaurs. In some niches, the plesiosaur becomes dominant (as is the Loch Ness monster); in others, the hippocamp-type serpent emerges as the apex monster (as is Caddy). But the truth is that sea serpents are shape-shifters. How could they not be? They are, after all, creatures of culture, not of nature. In all environments—in fiction, in the cryptozoological literature, and in the oceans of the mind—sea monsters teem and vary and return to type, as unpredictable, as unique, and yet as familiar as the waves themselves.

CLOSING THOUGHTS

Richard Owen's famous critique of the report of a sighting of a sea serpent by Captain Peter M'Quhae and other officers of the *Daedalus* contains a sentiment that speaks to my own values and approach to cryptids and other paranormal mysteries:

I am usually asked, after each endeavour to explain Captain M'Quhae's sea-serpent, "Why there should not be a great sea-serpent?"—often, too, in a tone which seems to imply, "Do you think, then, there are not more marvels in the deep than are dreamt of in your philosophy?" And freely conceding that point, I have felt bound to give a reason for scepticism as well as faith.²⁴⁰

Arguing about the burden of proof is one of skepticism's great clichés. It is common for skeptics to have to state the obvious: the world is not obligated to accept anyone's personal claims or speculations. If someone wants others to believe that there is a worldwide population of aquatic mega-serpents, he or she must present evidence that this is the case; others do not have to prove the claimant wrong. Yet when skeptics emphasize this "burden of proof," we may forget a deep truth: *Doubt is cheap. Finding out is hard.*

Incredulity requires no training, no knowledge, no investigation. "Any fool can disbelieve in sea serpents," as Archie Wills put it.²⁴¹ By itself, doubt does nothing to advance knowledge. Even Occam's celebrated razor is just a bet-

ting strategy. Parsimony tells us which proposed explanations to investigate *first*; it does not tell us which explanations are *true*. Often nature is simple and elegant, but sometimes it is not.

For this reason, Owen should be applauded for voluntarily taking up his own burden of proof. After all, the goal of science is not to stonewall weird ideas, but to find out what is true. He rested his case on the negative evidence that no bone or carcass or geologically recent fossil of a sea serpent had yet emerged, on all the coasts and in all the museums of the world. It is often said that “absence of evidence is not evidence of absence,” but this is only sometimes true. If a given hypothesis (“The world has giant sea monsters”) predicts that we should see certain evidence (“Therefore, the world has sea monster carcasses”) and we do not see that evidence (for the record, we do not), then that actually *is* evidence of absence. It may or may not be strong evidence, depending on the particulars of the case—but it is relevant, and it does count.

In this chapter, I have tried to present not only the negative evidence, but also a positive historical case for the sea serpent. The sea serpent can be shown, in my opinion, to be a cultural creation: a concept rather than an animal. It arose out of art, and then evolved and spread with changing fashions, popular media, and the happenstance of fossil discoveries. Yet even now, knowing all that, I must admit: that does not mean that there could not *also* be a sea serpent.

In 1933, a letter writer to the *Times* of London argued—somewhat oddly—that the existence of the sea serpent or Nessie would be disturbing to skeptics:

If there is one thing the sceptics doubt more than religion, it is the sea serpent, and now the sea serpent is in a fair way to becoming an established fact. The sceptics by their teachings and writings have made this life of ours drab and dreary enough. It is time the faithful rebelled, and if we can prove that the sea serpent exists there is no limit to the discomfiture that can be inflicted upon those who doubt.²⁴²

If only this correspondent had been able to enjoy the chance to gloat! If a sea serpent were ever to be discovered, it would be among the happiest days of my life. But one cannot prove a negative—or at least not easily, and not often. Do we really know that sea serpents do not exist? If there is one lesson to be drawn from what we do know, it is to avoid arbitrarily shoehorning diverse events into our favorite explanatory categories. Each individual sighting is its own mystery, resting on its own particular set of facts, posing its own challenge, requiring its own investigation. Most remain unsolved.

And what of my parents' sighting of Cadborosaurus—the event that propelled me into a career of skeptical paranormal investigation? I'll leave you with my father's closing thoughts:

Then it occurred to me: a half-dozen sea lions swimming nose-to-tail would look just like what we were seeing. . . . We stared and stared, trying to figure it out, debating the possibilities until it turned and swam out to sea. Even at that moment, looking right at it, we couldn't be sure. Now, 30 years later, I'm almost certain that I saw six or seven sea lions swimming together in a line, one after the other.

But, my wife is still 100 percent certain that she saw Cadborosaurus.

Maybe she's right.²⁴³

5. THE EVOLUTION OF THE SEA SERPENT

- 1 Benjamin Radford, *Tracking the Chupacabra: The Vampire Beast in Fact, Fiction, and Folklore* (Albuquerque: University of New Mexico Press, 2011).
- 2 Sherrie Lynne Lyons, *Species, Serpents, Spirits, and Skulls: Science in the Margins in the Victorian Age* (Albany: State University of New York Press, 2009).
- 3 Ray Bradbury, "The Fog Horn," in *The Golden Apples of the Sun* (New York: Morrow, 1997), 1–9, members.fortunecity.com/ymir1/beastfro9.html (accessed February 2, 2012).
- 4 Dennis Loxton to Daniel Loxton, April 8, 2005.
- 5 Depending on the movie, Godzilla's height ranges from a measly 167 to 334 feet tall, according to Robert Biondi, "So Just How Big Is Godzilla? A Model Builder's Guide to Godzilla's Size Changes," *Kaiju Review*, no. 4 (1993).

- 6 Emily Vermeule, *Aspects of Death in Early Greek Art and Poetry* (Berkeley: University of California Press, 1979), 183.
- 7 The Holy Bible, Revised Standard Version (Glasgow: Collins, 1952).
- 8 For an overview, see J. V. Kinnier Wilson, "A Return to the Problems of Behemoth and Leviathan," *Vetus Testamentum* 25, fasc. 1 (1975): 1–14.
- 9 John K. Papadopoulos and Deborah Ruscillo, "A *Ketos* in Early Athens: An Archaeology of Whales and Sea Monsters in the Greek World," *American Journal of Archaeology* 106, no. 2 (2002): 213.
- 10 *Ibid.*, 216.
- 11 *Ibid.*, 187–227.
- 12 Katharine Shepard, *The Fish-Tailed Monster in Greek and Etruscan Art* (New York: Privately printed, 1940; repr., Landisville, Pa.: Coachwhip, 2011), 78.
- 13 Papadopoulos and Ruscillo, "Ketos in Early Athens," 216–219.
- 14 John Boardman, "'Very Like a Whale': Classical Sea Monsters," in *Monsters and Demons in the Ancient and Medieval Worlds: Papers Presented in Honor of Edith Porada*, ed. Anne E. Farkas, Prudence O. Harper, and Evelyn B. Harrison (Mainz: Zabern, 1987), 73–84.
- 15 Diego Cuoghi, "The Art of Imagining UFOs," ed. Daniel Loxton, trans. Daniela Cisi and Leonardo Serna, *Skeptic* 11, no. 1. (2004): 43–51.
- 16 Bernard Heuvelmans, *In the Wake of the Sea-Serpents* (New York: Hill and Wang, 1968), 508. For further discussion, see Loren Coleman, "The Meaning of Cryptozoology: Who Invented the Term Cryptozoology?" 2003, www.lorencoleman.com/cryptozoology_faq.html (accessed February 12, 2011).
- 17 Heuvelmans, *In the Wake of the Sea-Serpents*, 96–99.
- 18 Boardman, "Very Like a Whale," 78.
- 19 A. C. Oudemans, *The Great Sea-Serpent* (1892; repr., Landisville, Pa.: Coachwhip, 2007), 89.
- 20 Adrienne Mayor, "Paleocryptozoology: A Call for Collaboration Between Classicists and Cryptozoologists," *Cryptozoology* 8 (1989): 12–26.
- 21 *Pausanias Description of Greece*, trans. W. H. S. Jones (London: Heinemann, 1918), Paus. 1.44.8.
- 22 Pliny the Elder, *The Natural History*, trans. H. Rackham, Loeb Classical Library 353 (Cambridge, Mass.: Harvard University Press, 1940), 3:bk. 9.5, 173.
- 23 Richard B. Stothers, "Ancient Scientific Basis of the 'Great Serpent' from Historical Evidence," *Isis* 95, no. 2 (2004): 223–226.
- 24 Aristotle, *History of Animals*, trans. D'Arcy Wentworth Thompson (Sioux Falls, S.Dak.: NuVision, 2004), bk. 4, chap. 8.
- 25 *Ibid.*, bk. 8, chap. 28.
- 26 Heuvelmans, *In the Wake of the Sea-Serpents*, 82.
- 27 Apollonius of Rhodes, *Jason and the Golden Fleece*, trans. Richard Hunter (New York: Oxford University Press, 1995), 102.
- 28 W. R. Branch and W. D. Hacke, "A Fatal Attack on a Young Boy by an African Rock Python *Python sebae*," *Journal of Herpetology* 14, no. 3 (1980): 305–307.

- 29 Richard Stothers, "Ancient Scientific Basis of the 'Great Serpent' from Historical Evidence," *Isis* 95, no. 2 (2004): 228–229.
- 30 Pliny used the word *Dracones*; John Bostock's translation of *Natural History* (1855) renders it as "dragons," while H. Rackham's translation (1940) substitutes "serpents."
- 31 Pliny the Elder, *Natural History*, 3:bk. 8.11, 25–27.
- 32 Edward Topsell, *The Historie of Serpents; or, the Second Booke of Living Creatures* (1608; LaVergue: ECCO Print Editions, 2011), 168.
- 33 Heuvelmans, *In the Wake of the Sea-Serpents*, 82.
- 34 Indeed, during my research I realized that this connection has occasionally been made. For example, the question was raised in this 2006 cryptozoology forum thread, in which poster Fel Faralei wondered, "It's a long shot but from what I've learn't about Caddy it seems to fit the description of a hippocampus quite well. . . . What if they were real only less beautiful and horse could it be caddy?" (http://www.cryptozoology.com/forum/topic_view_thread.php?tid=5&pid=372181 [accessed May 28, 2011]).
- 35 I based my drawing on eyewitness sketches and a composite drawing in Paul H. LeBlond and Edward L. Bousfield, *Cadborosaurus: Survivor from the Deep* (Victoria, B.C.: Horsdal & Schubart, 1995). In addition, I referred to artworks of Cadborosaurus by cryptozoological enthusiasts, including David John and Darren Naish.
- 36 Helen Scales, *Poseidon's Steed: The Story of Seahorses, from Myth to Reality* (New York: Gotham Books, 2009), 20–22.
- 37 Shepard, *Fish-Tailed Monster in Greek and Etruscan Art*, 26.
- 38 Scales, *Poseidon's Steed*, 31–33.
- 39 Publius Vergilius Maro, *Fourth Georgic of Virgil*, trans. R. M. Millington (London: Longmans, Green, Reader, and Dyer, 1870), 59.
- 40 Michael J. Curley, trans., *Physiologus: A Medieval Book of Nature Lore* (Chicago: University of Chicago Press, 2009), xvi–xix.
- 41 *Ibid.*, xxi–xxvi.
- 42 James Carlill, trans., *Physiologus*, in *The Epic of the Beast*, ed. William Rose (London: Routledge, 1900), 189, 199–200, 231, reprinted in *The Book of Fabulous Beasts: A Treasury of Writings from Ancient Times to the Present*, ed. Joseph Nigg (New York: Oxford University Press, 1999), 116.
- 43 Curley, trans., *Physiologus*, xxvi–xxxiii.
- 44 *The Etymologies of Isidore of Seville*, trans. Stephen A. Barney (Cambridge: Cambridge University Press, 2006), 260.
- 45 Richard Barber, trans., *Bestiary: Being an English Version of the Bodleian Library, Oxford M.S. Bodley 764 with All the Original Miniatures Reproduced in Facsimile* (London: Folio Society, 1992), 10.
- 46 Ian Whitaker, "North Atlantic Sea-Creatures in the King's Mirror (*Konungs Skuggsjá*)," *Polar Record* 23 (1986): 3–13.
- 47 Peter Gilliver, "J. R. R. Tolkien and the OED," Oxford English Dictionary, <http://www.oed.com/public/tolkien/> (accessed May 25, 2011).
- 48 Paul Henri Mallet, *Northern antiquities: or, An historical account of the manners, customs, religion and laws, maritime expeditions and discoveries, language and literature of the an-*

- cient Scandinavians, trans. Thomas Percy, rev. I. A. Blackwell (London: Henry G. Bohn, 1847), 514.
- 49 George Ripley and Charles A. Dana, eds., *The New American Cyclopaedia: A Popular Dictionary of General Knowledge* (New York: Appleton, 1869), 14:470–471.
- 50 According to Samuel Hibbert, “The faith in the Edda of the great serpent that Thor fished for, did not, as Dr Percy conceives, give rise to the notion of the sea-snake, but a real sea-snake was the foundation of the fable” (*A Description of the Shetland Islands: Comprising an Account of Their Geology, Scenery, Antiquities, and Superstitions* [Edinburgh: Constable, 1822], 565).
- 51 Oudemans, *Great Sea-Serpent*, 298.
- 52 Snorri Sturluson, prologue to *The Prose Edda*, trans. Arthur Gilchrist Brodeur (New York: American-Scandinavian Foundation, 1916).
- 53 Charles Mackay, *Memoirs of Extraordinary Popular Delusions and the Madness of Crowds* (1841; New York: Barnes and Noble, 2002), 105.
- 54 Albertus was also associated with astrology and alchemy, which were at that time respectable areas of intellectual inquiry. Still, his alchemical interests were probably exaggerated. As Mackay noted, many magical tales were associated with Albertus and Aquinas, including the rumor that Albertus could control the weather: “Such stories as these shew the spirit of the age. Every great man who attempted to study the secrets of nature was thought a magician” (*ibid.*, chap. 4).
- 55 Albert the Great, *Man and the Beasts: De animalibus*, Books 22–26, trans. James J. Scanlan (Binghamton, N.Y.: Medieval and Renaissance Texts and Studies, 1987), 350.
- 56 Olaus Magnus, *A Description of the Northern Peoples: Rome 1555*, ed. Peter Foote, trans. Peter Fisher and Humphrey Higgins (London: Hakluyt Society, 1998), 1124.
- 57 Ray Gibson “Nemertean Genera and Species of the World: An Annotated Checklist of Original Names and Description Citations, Synonyms, Current Taxonomic Status, Habitats and Recorded Zoogeographic Distribution,” *Journal of Natural History* 29, no. 2 (1995): 271–561; Adriaan Gittenberger and Cor Schipper, “Long Live Linnaeus, *Lineus longissimus* (Gunnerus, 1770) (Vermes: Nemertea: Anopla: Heteronemertea: Lineidae), the Longest Animal Worldwide and Its Relatives Occurring in the Netherlands,” *Zoologische Mededelingen* 82, no. 7 (2008): 59–63.
- 58 Olaus, *Description of the Northern Peoples*, 1128.
- 59 Oudemans, *Great Sea-Serpent*, 91.
- 60 “Recreations in Natural History . . . Ancient Flying Dragons, Pterosaurians, &c.,” *New Monthly Magazine and Humorist*, pt. 3 (1843): 38–39.
- 61 For example, cryptozoologists regularly discard Bigfoot cases with which paranormal or inexplicable elements are associated (such as glowing eyes, telepathy, or a UFO). Some cryptozoology Web sites even have policies that forbid discussions of the paranormal, which can badly distort the eyewitness record—and destroys cryptozoology’s foundation. For more on this issue, see Daniel Loxton, “An Argument That Should Never Be Made Again,” February 2, 2010, Skepticblog, <http://www.skepticblog.org/2010/02/02/an-argument-that-should-never-be-made-again/> (accessed October 4, 2011).

- 62 Erich Pontoppidan, *The Natural History of Norway: Part II* (London: Printed for A. Linde, 1755), 207–208.
- 63 Michel Meurger, with Claude Gagnon, *Lake Monster Traditions: A Cross-Cultural Analysis* (London: Fortean Times, 1988), 24.
- 64 Ibid., 28.
- 65 Pierre Belon, *De aquatilibus* (Paris: Charles Estienne, 1553), bk. 1:26–27.
- 66 Conrad Gesner, *Historiae animalium*, bk. 4, *Qui est de piscium & aquatiliū animantium natura* (Zurich, 1558), 433 (translated by Donald Prothero and Doug Henning).
- 67 Conrad Gesner, *Nomenclator aquafilium animantium* (1560), quoted in Oudemans, *Great Sea-Serpent*, 92.
- 68 Heuvelmans, *In the Wake of the Sea-Serpents*, 99–100.
- 69 Ambroise Paré, *On Monsters and Marvels*, trans. Janis L. Pallister (Chicago: University of Chicago Press, 1982), 112.
- 70 Historians warn of the distorting effects of labeling figures of the past as belonging to modern movements. For example, consider the first warning expressed by Rebekah Higgitt (curator and historian of science at the Royal Observatory Greenwich & National Maritime Museum): “Do not ever call anyone a scientist who would not have recognised the term. The word . . . was not actually *used* until the 1870s. If we use the term to describe anyone before this date we risk loading their views, status, career, ambitions and work with associations that just do not exist before this date” (“Dos and Don’ts in History of Science,” April 17, 2011, Teleskopos, <http://teleskopos.wordpress.com/2011/04/17/dos-and-donts-in-history-of-science/> [accessed September 7, 2011]). The modern tradition of scientific skepticism dates to the twentieth century. However, centuries of earlier thinkers tried their hands at similar debunking projects. They might not have felt a kinship with my work, but I feel a connection to theirs!
- 71 Sir Thomas Browne, *Pseudodoxia Epidemica: Or, Enquiries into Commonly Presumed Truths* (Oxford: Benediction Classics, 2009), 242.
- 72 There is some controversy about the attribution of the *Codex canadensis*. Here, I have deferred to François-Marc Gagnon of the Gail and Stephen A. Jarislowsky Institute for Studies in Canadian Art, who concludes, “Until there is proof to the contrary, he can be considered the author of the *Codex canadensis*” (“About Louis Nicolas: Biographical Notes on Louis Nicolas, Presumed Author of the *Codex canadensis*,” Library and Archives Canada, www.collectionscanada.gc.ca/codex/026014-1200-e.html [accessed May 2, 2011]).
- 73 Quoted in Meurger, with Gagnon, *Lake Monster Traditions*, 212.
- 74 Heuvelmans, *In the Wake of the Sea-Serpents*, 95.
- 75 Hans H. Lilienskiold, The Northern Lights Route, <http://www.ub.uit.no/northernlights/eng/lilienskiold.htm> (accessed May 25, 2011).
- 76 Hans Lilienskiold, *Speculum boreale eller den finmarchiske beskrifwelsis* (1698), quoted in Ole Lindquist, “Whales, Dolphins and Porpoises in the Economy and Culture of Peasant Fishermen in Norway, Orkney, Shetland, Faeroe Islands and Iceland, ca. 900–1900 A.D., and Norse Greenland, ca. 1000–1500 A.D.” (Ph.D. diss., University of St Andrews, 1994), 2:sec. A.18, 1003–1006, www.fishernet.is/is/hvalveidar/19/35 (accessed May 25, 2011).

- 77 Heuvelmans, *In the Wake of the Sea-Serpents*, 114.
- 78 Pontoppidan, *Natural History of Norway*, iv.
- 79 Ibid., 196.
- 80 Ibid.
- 81 Ibid.
- 82 Ibid.
- 83 Ibid., 196–197.
- 84 Henry Lee, *Sea Monsters Unmasked* (London: Clowes, 1883), 63.
- 85 Meurger, with Gagnon, *Lake Monster Traditions*, 17.
- 86 Heuvelmans, *In the Wake of the Sea-Serpents*, 112.
- 87 Lee, *Sea Monsters Unmasked*, 2–3.
- 88 Daniel Loxton, “Bishop Pontoppidan Versus the Tree Geese,” February 8, 2011, Skepticblog, <http://www.skepticblog.org/2011/02/08/bishop-pontoppidan-versus-the-tree-geese/> (accessed February 12, 2011).
- 89 Pontoppidan, *Natural History of Norway*, 208.
- 90 Heuvelmans, *In the Wake of the Sea-Serpents*, 34.
- 91 Pliny the Elder, *Natural History*, 3:bk. 9.4, 171.
- 92 *A True and Perfect Account of the Miraculous Sea-Monster or Wonderful Fish Lately Taken in Ireland* (London: Printed for P. Brooksby and W. Whitwood, 1674).
- 93 “Wernerian Natural History Society,” *Philosophical Magazine* 33 (1809): 90–91.
- 94 Rupert T. Gould, *The Case for the Sea-Serpent* (London: Allan, 1930; New York: Putnam, 1934), 239.
- 95 James Ritchie, “More About Monsters: The Sea-Serpent of Stronsay,” *Times* (London), December 16, 1933, 15.
- 96 “Here’s First Genuine Sea Monster Captured: Odd Fish Stumps Scientist,” *Los Angeles Times*, March 3, 1934, 3; “France Has Sea Monster and the Body to Prove It,” *New York Times*, March 1, 1934, 1.
- 97 “Sea ‘Monster’ Is Declared a Basking Shark: French Scientists Say It Is Not an Odd Fish,” *New York Times*, March 16, 1934, 18.
- 98 Associated Press, “‘Sea Serpent’ Body Is Found in Pacific,” *New York Times*, November 23, 1934, 21.
- 99 Associated Press, “Canada’s ‘Sea Serpent’ Found to Be Only Shark,” *New York Times*, November 27, 1934, 23.
- 100 John Saar, “Fishermen Made a Monstrous Mistake,” *Washington Post*, July 21, 1977, 2.
- 101 John Saar, “‘Plesiosaurus’ Find: Monster Mystery Surfaces in Japan,” *Los Angeles Times*, July 21, 1977, B6.
- 102 Ellis, *Monsters of the Sea* (New York: Lyons Press, 2001), 69.
- 103 John Goertzen, “New *Zuiyo Maru* Cryptid Observations: Strong Indications It Was a Marine Tetrapod,” *CRS Quarterly* 38, no. 1 (2001): 19–29, http://www.creationresearch.org/crsq/articles/38/38_1/Cryptid.htm (accessed October 6, 2011).
- 104 Christopher McGowan, *The Dragon Seekers: How an Extraordinary Circle of Fossilists Discovered the Dinosaurs and Paved the Way for Darwin* (New York: Basic Books, 2001), ix.
- 105 For example, Thomas Jefferson suspected that mammoths or mastodons might survive in his time in the western interior of the North American continent. Avidly interested in

- fossils, but unconvinced about extinction, Jefferson hoped on the basis of Native American fossil lore that the Lewis and Clark expedition might encounter living specimens. (Today, we might call Jefferson's speculation an example of cryptozoology.) For a discussion of Jefferson's thoughts, see Adrienne Mayor, *Fossil Legends of the First Americans* (Princeton, N.J.: Princeton University Press, 2005), 55–61.
- 106 William D. Conybeare, "On the Discovery of an Almost Complete Skeleton of the Plesiosaurus," *Philosophical Transactions of the Geological Society of London*, 2nd ser., 1 (1824): 381–389; McGowan, *Dragon Seekers*, 78–84.
 - 107 William Hooker, "Additional Testimony Respecting the Sea-Serpent of the American Seas," *Edinburgh Journal of Science* 6 (1827): 126–133.
 - 108 Robert Bakewell, *Introduction to Geology* (New Haven, Conn.: Howe, 1833), 213.
 - 109 Benjamin Silliman, footnote in *ibid.*, 214.
 - 110 John Ruggles Cotting, *A Synopsis of Lectures on Geology, Comprising the Principles of the Science* (Taunton, Mass.: Published for the author, 1835), 58–59.
 - 111 Heuvelmans, *In the Wake of the Sea-Serpents*, 276.
 - 112 Lyons, *Species, Serpents, Spirits, and Skulls*, 19.
 - 113 Gould, *Case for the Sea-Serpent*, 96, 99.
 - 114 This request for a report was recorded in the Admiralty records, according to *ibid.*, 96.
 - 115 Peter M'Quhae, "The Great Sea Serpent" [letter to the editor], *Times*, October 14, 1848, 3.
 - 116 Gould, *Case for the Sea-Serpent*, 97–101.
 - 117 *Ibid.*, 107.
 - 118 *Ibid.*, 105–106.
 - 119 F. G. S., "To the Editor of the Times," *Times*, November 2, 1848, 3.
 - 120 Philip Henry Gosse, *The Romance of Natural History* (London: Nisbet, 1863), 347.
 - 121 [Richard Owen], review of *On the Origin of Species*, by Charles Darwin, *Edinburgh Review* 111 (1860): 487–532.
 - 122 Charles Darwin to Joseph Dalton Hooker, August 4, 1872, Darwin Correspondence Project, <http://www.darwinproject.ac.uk/entry-8449> (accessed February 19, 2012).
 - 123 Quoted in Oudemans, *Great Sea-Serpent*, 219.
 - 124 Richard Owen, "The Sea Serpent," *Times*, November 14, 1848, 8.
 - 125 Louis Agassiz, "Extract from the Thirteenth Lecture of Professor Agassiz, Delivered in Philadelphia, Tuesday Evening, March 20, 1849," in Eugene Batchelder, *A Romance of the Fashionable World* (Boston: French, 1857), 153–157.
 - 126 Louis Agassiz, "Eugene Batchelder, Esq.—," in *ibid.*, 152–153.
 - 127 Edward Newman, in *Zoologist* 7 (1849): 2356.
 - 128 Willy Ley, *Willy Ley's Exotic Zoology* (1959; New York: Bonanza Books, 1987), 224.
 - 129 Newman, in *Zoologist*, x–xi.
 - 130 Gould, *Case for the Sea Serpent*, 84–85. I was not surprised to see this. Gould was among the more thorough and responsible of the early-twentieth-century proponents of both the sea serpent and the Loch Ness monster.
 - 131 Gosse, *Romance of Natural History*, 368.

- 132 An instantly created river implies previous rain; sand implies previous erosion; tree rings imply seasons past; an animal's body implies gestation, growth, respiration, and so on. Consider fur: if God created, say, bunny rabbits, their silky pelts imply a prior period of hair growth. As Philip Henry Gosse put it,

We have passed in review before us the whole organic world: and the result is uniform; that no example can be selected from the vast vegetable kingdom, none from the vast animal kingdom, which did not at the instant of its creation present indubitable evidences of a previous history. This is not put forth as a *hypothesis*, but as a *necessity*; I do not say that it was *probably* so, but that it was *certainly* so; not that it *may have been thus*, but that it *could not have been otherwise*. (*Omphalos: An Attempt to Untie the Geological Knot* [London: Van Voorst, 1857], 335)

- 133 Stephen Jay Gould, "Adam's Navel," in *The Flamingo's Smile: Reflections in Natural History* (New York: Norton, 1985), 100.
- 134 Philip Henry Gosse, *The Aquarium: An Unveiling of the Wonders of the Deep Sea* (London: Van Voorst, 1856).
- 135 Gosse, *Romance of Natural History*, 298.
- 136 Gosse and Darwin were socially acquainted and exchanged friendly correspondence on orchid cultivation and variation, as well as other topics. Darwin was especially impressed by Gosse's experiments with marine aquariums: "I saw Mr Gosse the other night & he told me that he had now the same several sea-animals & algæ living & breeding for 13 months in the same artificially made sea water! Does not this tempt you? it almost tempts me to set up a marine vivarium" (Charles Darwin to J. S. Henslow, March 26, 1855, Darwin Correspondence Project, <http://www.darwinproject.ac.uk/entry-1655> [accessed September 10, 2011]).
- 137 Gosse, *Romance of Natural History*, 364.
- 138 *Ibid.*, 358–359.
- 139 Jules Verne, *Journey to the Center of the Earth*, trans. Willis T. Bradley (New York: Ace Books, 1956), 187–188.
- 140 Edgar Rice Burroughs, *The Land That Time Forgot*, chaps. 4 and 5, <http://www.literature.org/authors/burroughs-edgar-rice/the-land-that-time-forgot/chapter-04.html> (accessed September 12, 2011).
- 141 Gould, *Case for the Sea Serpent*, 277.
- 142 "The Hydrargos sillimanii, or Great Sea Serpent," *New York Daily Tribune*, August 29, 1845, 1.
- 143 "Orange County Milk," *New York Observer and Chronicle*, January 25, 1845, 14.
- 144 "Hydrargos sillimanii, or Great Sea Serpent."
- 145 Douglas E. Jones, "Doctor Koch and His 'Immense Antediluvian Monsters,'" *Alabama Heritage* 12 (1989): 2–19.
- 146 *Ibid.*
- 147 Jeffries Wyman, "Hydrarchos sillimani," *Proceedings of the Boston Society of Natural History* 2 (1848): 65–68.
- 148 Jones, "Doctor Koch and his 'Immense Antediluvian Monsters.'"

- 149 James D. Dana, "On Dr. Koch's Evidence with Regard to the Contemporaneity of Man and Mastodon in Missouri," *American Journal of Science and Arts* 9 (1875): 335-346.
- 150 Ibid.
- 151 Quoted in George E. Gifford Jr., "Twelve Letters from Jeffries Wyman, M.D.: Hampden-Sydney Medical College, Richmond, Virginia, 1843-1848," *Journal of the History of Medicine and Allied Sciences* 20, no. 4 (1965): 320-322.
- 152 Dr. Lister, in *Proceedings of the Boston Society of Natural History* 2 (1848): 94-96.
- 153 Albert Koch, *Journey Through a Part of the United States in the Years 1844 to 1846*, trans. Ernst A. Stadler (Carbondale: Southern Illinois University Press, 1972), 104.
- 154 Ibid., 32.
- 155 Oddly enough, thanks to the rules of taxonomic priority, it is *Basolisaurus* that remains enshrined in the nomenclature. For Owen's analysis, see Richard Owen, "On the Teeth of the Zeuglodon (Basilosaurus of Dr. Harlan)," *Proceedings of the Geological Society of London* 3 (1842): 23-28.
- 156 Jones, "Doctor Koch and his 'Immense Antediluvian Monsters.'"
- 157 Brian Switek, *Written in Stone: Evolution, the Fossil Record, and Our Place in Nature* (New York: Bellevue Literary Press, 2010), 152, 277.
- 158 Robert Silverberg, *Scientists and Scoundrels: A Book of Hoaxes* (New York: Crowell, 1965), 67.
- 159 Google Books: Ngram Viewer, <http://goo.gl/uxsjN> (accessed September 22, 2011).
- 160 Owen, "Sea Serpent," 8.
- 161 George R. Price, "Science and the Supernatural," *Science* 122 (1955): 363.
- 162 "The Great Sea Serpent," *Eclectic Magazine of Foreign Literature* 17, no. 2 (1849): 234.
- 163 Michael Shermer, "Miracle on Probability Street," August 2004, <http://www.michaelshermer.com/2004/08/miracle-on-probability-street/> (accessed August 3, 2011).
- 164 Captain Elkanah Finney, description of a sighting in 1815, recorded in 1817, quoted in Oudemans, *Great Sea-Serpent*, 128.
- 165 Edward Newman, "Notes on the Zoology of Spitsbergen," *Zoologist* 24 (1864): 202-203.
- 166 *Province* [Vancouver], March 9, 1943, 1, quoted in LeBlond and Bousfield, *Cadborosaurus*, 70.
- 167 Ley, *Willy Ley's Exotic Zoology*, 213.
- 168 Oudemans, *Great Sea-Serpent*, 53.
- 169 Loren Coleman, "Otter Nonsense," June 5, 2007, CryptoMundo, <http://www.cryptomundo.com/cryptozoo-news/otter-nonsense/> (accessed September 24, 2011).
- 170 Photograph by Tony Markle, reprinted in Loren Coleman, "Real Otter Sense," June 16, 2011, CryptoMundo, <http://www.cryptomundo.com/cryptozoo-news/real-otter-sense/> (accessed September 24, 2011).
- 171 Alex Campbell to Ness Fishery Board, October 28, 1933, quoted in Rupert Gould, *The Loch Ness Monster* (1934; Secaucus, N.J.: Citadel Press, 1976), 110-112.
- 172 McTaggart-Cowan went on to serve as head of the Department of Zoology at the University of British Columbia, and then the dean of graduate studies. See "Ian McTaggart-Cowan, Part 2," Heritage Conservation Trust Foundation, <http://www.hctf.ca/AboutUs/mctaggart2.html> (accessed September 26, 2011).

- 173 Quoted in Ray Gardner, "Caddy, King of the Coast," *Maclean's*, June 15, 1950, 43.
- 174 Oudemans, *Great Sea-Serpent*, 345.
- 175 Gosse, *Romance of Natural History*, 338–340.
- 176 Indeed, these cases are so similar that a few have suggested the possibility of plagiarism. Gould wrote, "The accounts given by Smith and Herriman are so singularly alike that one might be pardoned for thinking that one was copied from the other" (*Case for the Sea-Serpent*, 138–139). However, he felt that this "very remarkable string of coincidences" was unlikely to be anything more sinister than coincidence. Heuvelmans was more suspicious, saying that the story Captain Smith told of his adventure aboard the *Pekin* "seems most unlikely to have happened to him at all" (*In the Wake of the Sea-Serpents*, 201–202).
- 177 Quoted in Oudemans, *Great Sea-Serpent*, 342.
- 178 Quoted in "Notes," *Nature*, October 13, 1881, 565, <http://books.google.ca/books?id=TMMKAAAYAAJ> (accessed September 24, 2011).
- 179 Pontoppidan, *Natural History of Norway*, 201.
- 180 Oudemans, *Great Sea-Serpent*, 396.
- 181 Archie H. Wills, "All in a Lifetime" (ca. 1985), 61–62 (hand-bound, typed manuscript), Central Branch, Greater Victoria Public Library, Victoria, B.C.
- 182 *Ibid.*, 62.
- 183 The *Victoria Daily Times* managed not to resort to layoffs, but only because the staff accepted two waves of across the board wage cuts. See *ibid.*, 61.
- 184 "A Cure for the Sea Serpent," *Critic*, July–December 1885, 153.
- 185 Quoted in Gardner, "Caddy, King of the Coast," 24.
- 186 See, for example, Bruce S. Ingram, "The Loch Ness Monster Paralleled in Canada, 'Cadborosaurus,'" *Illustrated London News*, January 6, 1934, 8; "Animals: Cup & Saucer," *Time*, October 16, 1933; and Bert Stoll, "Sea Serpent Appears Off Vancouver Island," *New York Times*, February 11, 1934.
- 187 Archie Wills, in *Victoria Daily Times*, June 8, 1959, 12, clipping, Archie H. Wills Fonds, University of Victoria Archives, Victoria, B.C.
- 188 Gardner, "Caddy, King of the Coast," 43.
- 189 "Yachtsmen Tell of Huge Serpent Seen off Victoria," *Victoria Daily Times*, October 5, 1933, clipping, Archie H. Wills Fonds.
- 190 "Not Humpback Says Langley," *Victoria Daily Times*, October 18, 1933.
- 191 Quoted in Ingram, "Loch Ness Monster Paralleled in Canada."
- 192 *Ibid.*
- 193 R. G. Rhodes, "The Diplodocus" [letter to the editor], *Victoria Daily Times*, October 16, 1933.
- 194 Quoted in "Says Serpent Not Conger Eel," *Victoria Daily Times*, October 17, 1933.
- 195 Quoted in "Caddy," *Victoria Daily Times*, October 20, 1933.
- 196 "The 8th Wonder of the World! Starts today for three days. Adventure that Leaps Far Beyond the Bounds of Imagination! Unique! Thrilling! Startling!" proclaimed the advertisement in the *Victoria Daily Times*, May 20, 1933, 9.
- 197 Quoted in Gardner, "Caddy, King of the Coast," 42.

- 198 Wills, "All in a Lifetime," 62–63.
- 199 G. Clifford Carl, *Guide to Marine Life of British Columbia* (Victoria: Royal British Columbia Museum, 1963), 134.
- 200 Wills, "All in a Lifetime," 62.
- 201 Quoted in Gardner, "Caddy, King of the Coast," 24.
- 202 Jim McKeachie, "\$200 Offered for Caddy Photo," *Victoria Daily Times*, March 31, 1951, and "Doctor Carl Enters First 'Photograph' of Caddy in Times' \$200 Competition," *Victoria Daily Times*, April 16, 1951, clippings, Archie H. Wills Fonds.
- 203 Michael A. Woodley, Darren Naish, and Hugh P. Shanahan, "How Many Extant Pinniped Species Remain to Be Described?" *Historical Biology* 20, no. 4 (2008): 225–235.
- 204 John Kirk, "BCSCC Member Sights Cadborosaurus-like Animal in Fraser River," *BCSCC Quarterly*, September 2010, 6. Kirk has also reported several sustained daylight sightings of 60-foot, serpentine Ogopogo—"I have had 11 sightings" (John Kirk, e-mail to Daniel Loxton, April 21, 2012)—and to have shot several sequences of video in association with those sightings. In one dramatic report, Kirk claimed to have seen two Ogopogos traveling together "like a series of arches. I could see the other shore through the gap between the underside of the humps and the water's surface. By being able to see under the arched humps I knew I was definitely not seeing a boat wake or an unusual wave effect, but rather the enormous forms of two huge aquatic animals which were members of the Ogopogo brood" (*In the Domain of the Lake Monsters* [Toronto: Key Porter Books, 1998], 18–20; see also 44–26, 52–53, 69–74, 80).
- 205 As of this writing, other skeptical investigators and I have seen only those segments of the video that appeared in previews for *Alaskan Monster Hunt*. At first glance, the "creatures" in the film appear more like a boat wake than a family of Caddys, but I'll reserve judgment until I've had a chance to review the entire video in detail.
- 206 Owen, "Sea Serpent," 8.
- 207 Edward L. Bousfield and Paul H. LeBlond, "Preliminary Studies on the Biology of a Large Marine Cryptid in Coastal Waters of British Columbia," *American Zoologist* 32 (1992): 2A, and "An Account of *Cadborosaurus willsi*, New Genus, New Species, a Large Aquatic Reptile from the Pacific Coast of North America," *Amphipacifica*, suppl. 1 (1995): 3–25. Bousfield was a retired research associate at the Royal Ontario Museum, and LeBlond was a professor of oceanography at the University of British Columbia.
- 208 Darren Naish, "Cadborosaurus and the Naden Harbour Carcass: Extant Mesozoic Marine Reptiles, or Just Bad Bad Science?" September 2, 2006, Tetrapod Zoology, http://darrennaish.blogspot.com/2006/09/cadborosaurus-and-naden-harbour_02.html (accessed September 26, 2011).
- 209 LeBlond and Bousfield, *Cadborosaurus*, 79.
- 210 "I don't agree with their conclusions," wrote Darren Naish, "but I do respect the guts and determination involved in publishing these ideas" ("A Baby Sea-Serpent No More: Reinterpreting Hagelund's Juvenile *Cadborosaurus*," September 26, 2011, Tetrapod Zoology, <http://blogs.scientificamerican.com/tetrapod-zoology/2011/09/26/baby-sea-serpent-no-more/> [accessed September 28, 2011]).
- 211 LeBlond and Bousfield, *Cadborosaurus*, 55.

- 212 “Baby Sea Serpent Found in Stomach of Whale,” *Los Angeles Times*, July 11, 1937, 3.
- 213 Jim Cosgrove, e-mail to Daniel Loxton, July 11, 2002. At the time, Cosgrove, a marine biologist, was the acting manager of natural history at the museum.
- 214 Or is there? I have long regarded the case of the Naden Harbour carcass as permanently unsolvable, so I was very surprised when Darren Naish contacted me during the last stages of preparing this manuscript to let me know that he and his colleagues believe that they have solved the mystery (Darren Naish, e-mail to Daniel Loxton, September 28, 2011). I look forward to reading their argument in print!
- 215 This bit of fakelore tells of “a beautiful Indian maiden, Cadboro,” whose lover was transformed into a monster. See, for example, T. W. Paterson, “Sea Serpents Might Exist,” *Daily Colonist*, May 23, 1965, 10. However, Cadboro Bay was actually named for a ship that belonged to the Hudson’s Bay Company around 1842: the brigantine *Cadboro*, said to have been the first European vessel to anchor in the bay. The British Columbia Geographical Names Office adds, “Note that her log book and journal (copies of which are in the Provincial Archives) confirm the spelling ‘Cadboro’” (BCGNIS Query Results, <http://archive.ilmb.gov.bc.ca/bcgn-bin/bcg10?name=38867> [accessed September 28, 2011]).
- 216 Associated Press, “Amy, *Cadborosaurus*,” *San Francisco Examiner*, November 3, 1933, clipping, Archie H. Wills Fonds.
- 217 Bob Davis, “Bob Davis Reveals: Authentic Sea Serpent Due to Arrive Any Moment off Canada,” *New York Sun*, October 31, 1940, clipping, Archie H. Wills Fonds.
- 218 Archie Wills to Paul LeBlond and John R. Sibert, August 16, 1970. My thanks to Paul LeBlond for sharing his correspondence with Archie Wills—essential original sources that are not otherwise part of the public record.
- 219 William Carpenter, “On the Influence of Suggestion in Modifying and Directing Muscular Movement, Independently of Volition,” *Notices of the Meetings of the Royal Institution*, March 12, 1852, 147–153.
- 220 Loren Coleman and Patrick Huyghe, *The Field Guide to Lake Monsters, Sea Serpents, and Other Mystery Denizens of the Deep* (New York: Penguin/Tarcher, 2003), 26.
- 221 Jack Nord, letter to the editor, *Victoria Daily Times*, October 11, 1933, Archie H. Wills Fonds.
- 222 Robin Baird, “Elephant Seals Around Southern Vancouver Island,” *Victoria Naturalist* 47, no. 2 (1990): 6–7.
- 223 Ray Wormald, “Caddy Has Three Heads,” [*Victoria Daily Times*], April 6, 1951, clipping, Archie H. Wills Fonds.
- 224 Stephen Cosgrove, e-mail to Daniel Loxton, April 17, 2012.
- 225 *Myths and Monsters*, broadcast on CBC, October 29, 1950, script or transcript, Archie H. Wills Fonds.
- 226 Cameron McCormick, “A Baby Cadborosaur No More. Part 4: What Is ‘Cadborosaurus’?” September 21, 2011, The Lord Geekington, <http://www.thelordgeekington.com/2011/09/baby-cadborosaur-no-more-part-4-what-is.html> (accessed September 28, 2011).
- 227 T. H. Huxley, “The Sea Serpent,” *Times*, January 11, 1893, 12.

- 228 Loren Coleman and Patrick Huyghe, *The Field Guide to Bigfoot and Other Mystery Primates* (San Antonio, Tex.: Anomalist Books, 2006).
- 229 Many authors confidently credit this sighting to Hans Egede; others either are vague about whether he personally witnessed this monster or assert that it was instead his son Poul who was the witness. Oudemans, for example, credits this as “the Sea-Serpent, as seen by Hans Egede, drawn by Bing” (*Great Sea-Serpent*, fig. 19), presumably after Pontoppidan, who specifies, “Mr. Bing, one of the missionaries . . . took a drawing of it (*Natural History of Norway*). Ellis concurs: “Since Egede was known as a sober, reliable observer, this picture thus became one of the earliest illustrations of a sea monster based upon a reliable eyewitness account” (*Monsters of the Sea*, 44). Others, however, clarify the record: “Hans Egede (1686–1758) was not a witness and his account is second-hand based presumably on the recollection of his son Poul (1708–1789) which was published separately later (P. Egede, 1741)” (Charles G. M. Paxton, Erik Knatterud, and Sharon L. Hedley, “Cetaceans, Sex and Sea Serpents: An Analysis of the Egede Accounts of a “Most Dreadful Monster” Seen off the Coast of Greenland in 1734,” *Archives of Natural History* 32, no. 1 [2005]: 1–9). It is in Poul Egede’s book *Continuation af den Grønlandske Mission: Forfattet i form af en Journal fra Anno 1734 til 1740* (1741) that a well-known early sketch of a sea serpent (drawn, according to Paxton and his colleagues, “by Egede senior,” on the basis that the map is signed “H. E.”) is found. The authorship of the map remains uncertain, though, according to Charles Paxton, e-mail to Daniel Loxton, April 22, 2012.
- 230 Pontoppidan, *Natural History of Norway*, 199.
- 231 A young gentleman of the Customs, in *Morning Chronicle and London Advertiser*, August 24, 1786, 3.
- 232 *Morning Post and Daily Advertiser*, September 9, 1786, 3.
- 233 Charles Gould, *Mythical Monsters* (London: Allen, 1886), 263.
- 234 Heuvelmans, *In the Wake of the Sea-Serpents*, 572–573.
- 235 Coleman and Huyghe, *Field Guide to Lake Monsters*, 73.
- 236 Heuvelmans, *In the Wake of the Sea-Serpents*, 277.
- 237 *Ibid.*, 284.
- 238 Charles Paxton, “The Monster Manual,” *Fortean Times*, no. 256, July 2010, www.forteanimes.com/features/commentary/4003/the_monster_manual.html (accessed February 28, 2011).
- 239 A meme is a small unit of “idea”—a piece of culture, like a catchy tune or the notion of teacup—that can be passed along from one host (a mind, a book, or any other place where an idea can survive and replicate) to another. Just as genes can be connected into successful organisms, so small ideas (memes) can be connected into successful collaborations. A classic example is the collaboration of the idea of “god” with the idea “tell people.” These two ideas mutually reinforce, spreading farther and more quickly together than apart. It is an idea that is most usefully considered as a metaphor. Richard Dawkins introduced the concept of the meme in his book *The Selfish Gene* (New York: Oxford University Press, 1976), although others had proposed similar ideas in the past.
- 240 Owen, “Sea Serpent,” 8.

241 Archie Wills, “Cynics,” *Victoria Daily Times*, October 11, 1933.

242 Edward Cadogan, letter to the editor, *Times*, December 20, 1933, 8.

243 Dennis Loxton to Daniel Loxton, April 8, 2005.